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Camp-Fires on Desert and Lava

William T. Hornaday

exploring the unknown Pinacate region of northwestern Mexico in 1908

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Two years after the success of his *Camp-Fires in the Canadian Rockies*, William Temple Hornaday wrote this companion volume about his experiences on a trip to a totally different part of the West—the Pinacate region southwest of the Arizona border which he called "the most wonderful desert region of all America."

This was a busman's holiday for one of America's leading naturalists. Dr. Hornaday was Director of New York Zoological Park, author of many distinguished books of natural history, and former chief taxidermist of the U.S. Natural Museum, and from the very first page his story conveys his great enjoyment of exploring, hunting, and wandering through the land of Pinacate the mysterious.

Any group composed of experienced scientists and expert outdoorsmen could be counted on to turn its travels into something more than a holiday and a pleasure jaunt, and indeed the Hornaday party made a lasting contribution in their records and observations. The region they explored had been unknown previously except to a few Papago Indians—a rugged and colorful wonderland of the Southwest that no American traveler, geographer, sportsman, or naturalist had ever before traversed or mapped. As *Outdoor Life* pointed out in a review of the book, "The marvellous varieties of plant and animal life encountered, the incidents of camp life and of the life of the trail, and the adventures of the party unite to make a book of rare quality."

It is the combination of science and adventure that makes Dr. Hornaday's book so readable and remarkable sixty years after its first appearance.

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CAMPFIRES ON DESERT AND LAVA

William T. Hornaday

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A Note to the Reader

Two years after the success of his *Camp-Fires in the Canadian Rockies*, William Temple Hornaday wrote this companion volume about his experiences on a trip to a totally different part of the West, the Pinacate region southwest of the Arizona border which he called "the most wonderful desert region of all America."

Accompanying him on this trip into an unknown country were John M. Phillips, who had shared his adventures in the Canadian Rockies, Pennsylvania State Game Commissioner, an outstanding sportsman and photographer; Dr. D. T. MacDougal, "commander-in-chief," Director of the Department of Botanical Research of the Carnegie Institution of Washington with headquarters at the Desert Botanical Laboratory in Tucson, Arizona, and "a mighty good shot"; Godfrey Sykes, "the Arizona Wonder . . . official geographer to the expedition, also civil engineer, mechanical expert, wonderful wagon-fixer, and very agreeable gentleman," and others listed on page 24.

Dr. Hornaday set forth in a jubilant mood. This was a busman's holiday for one of America's leading naturalists, the Director of New York Zoological Park, author of many distinguished books of natural history, former chief taxidermist of the U.S. Natural Museum, and wildlife conservationist.

From the very first page his story conveys the author's own great enjoyment of camping, exploring, hunting, and wandering through the land of Pinacate the mysterious. Any group composed of such experienced scientists and expert outdoorsmen could be counted on to turn its travels into something more than a holiday and a pleasure jaunt, and indeed the Hornaday party made a lasting contribution in their records and observations of a

region which had been unknown except to a few Papago Indians, a rugged and colorful wonderland of the southwest that no American traveler, explorer, geographer, sportsman or naturalist had ever before traversed or mapped. As *Outdoor Life* pointed out in a review of the book, "The marvellous varieties of plant and animal life encountered, the incidents of camp life and of the life of the trail, and the adventures of the party unite to make a book of rare quality." It is the combination of science and adventure that makes Dr. Hornaday's book even now, sixty years after its first appearance, so readable and remarkable.

C. A. P.

CAMP-FIRES ON DESERT AND LAVA

The Rainbow Rams, on the Lava Peak

Painted by Carl Rungius, after sketch and photograph by John M. Phillips. Page 197.

CAMP-FIRES ON DESERT AND LAVA

BY

WILLIAM T. HORNADAY, Sc.D.

AUTHOR OF "THE AMERICAN NATURAL HISTORY,"
"CAMP-FIRES IN THE CANADIAN ROCKIES," ETC.

PHOTOGRAPHICALLY ILLUSTRATED BY
DR. DANIEL TREMBLY MacDOUGAL, MR. JOHN M. PHILLIPS, AND THE AUTHOR

WITH TWO NEW AND ORIGINAL MAPS BY
MR. GODFREY SYKES
GEOGRAPHER TO THE EXPEDITION

NEW YORK
CHARLES SCRIBNER'S SONS
1908

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WILLIAM T. HORNADAY

Published October, 1908

To

DANIEL TREMBLY MacDOUGAL, Ph.D., Etc.

ALL-AROUND BOTANIST, ZOOLOGIST, SPORTSMAN AND GOOD FELLOW,

WHO BUILT FOR US A CHAIN OF CAMP-FIRES

FROM TUCSON TO PINACATE,

ON THE GREATEST DESERT TRIP IMAGINABLE,

THIS VOLUME IS DEDICATED

FOREVER.

W. T. H.

PREFACE

PRIMARILY, the expedition described in the following pages was an exploration of a genuine terra incognita. While it is true that the Pinacate region was known to a few Papago Indians and perhaps half a dozen Mexicans, to the reading and thinking world it was totally unknown; and the more we gathered maps and inquired about it, the less we knew. On all available maps the space around the Pinacate dot was a blank, and usually the dot itself was far out of place. There was not a soul who knew enough about the country to say "lava."

Naturally, the animal and plant life of the Pinacate region was as much unknown as its geography; hence our combination of botanist, zoologist, sportsman, and geographer. In any wild country, that is "a good hand to draw to," and with the three jolly good fellows whose company I shared, I could enjoy exploring any country this side of the Styx. Indeed, I would take my chances with them beyond it.

Ever since it was my good fortune to see the Rocky-Mountain big-horn at its culminating point in British Columbia, I had been keenly desirous of studying that species at the point where its progress southward is stopped by fierce heat, and scanty food and water. It

seemed to me that in the Pinacate region we might in all probability find one of the jumping-off places of the genus *Ovis* in North America; which we did.

Much depends upon the point of view. No man should make the mistake of exploring a desert in hot weather. It is equalled in folly only by the exploration of the polar regions in winter. A hard season always begets unreasonable prejudices in the mind of the observer. The choice of companions also has very much to do with the point of view. Don't visit any desert under the handicap of Indian "guides." They are enough to depress the spirits of a barometer; and some of them will even abandon you in the wilds! Go with from one to six good white men, with red blood in their veins, or postpone the event.

Of the books that I had read previous to my desert experience, not one gave me a clear-cut and adequate impression of southern Arizona. Of the northwestern corner of Mexico, practically nothing had been written. I based my expectations upon existing records—and never was more surprised in a country. This book represents an effort to show the Reader a strange, weird, and also beautiful country as it looked to me.

I did not sample the terrors of the deserts. The seamy sides of lands and peoples do not attract me. I have little patience with travellers who are eternally getting into scrapes, and having heart-rending "sufferings" and "adventures." In all save the wildest of the wild regions of earth, such doings indicate bad judgment and a lack of the Savvey of the Trail which every explorer

and sportsman should possess. It is possible for men to have terrible "experiences" anywhere. Men have been frozen to death in the streets of New York, and very recently others have perished miserably in the New Jersey marshes, within sight of hundreds of electric lights. The deserts have their dangers also—for men who ignorantly and rashly rush into them; but in any country the best travellers are those who know how to do their work and avoid such things.

In November, southern Arizona is fascinating, no less. The boundless space, the glorious sunshine, the balmy air, the cleanness of the face of Nature, the absence of dust, filth, waste paper, polluted streams, dirty humanity, and many other things that wear on Life in a great city, strongly appeal to me. The countries that will grow corn and wheat and hogs in great abundance per acre are not the only lands worth knowing. Consider Arizona. Certainly it is a Land of Health, and if ever I am called upon to die in the East, I will go there and live.

The Discerning Reader will not need to be told categorically how greatly I am indebted to my companions, Dr. MacDougal, Mr. Phillips, and Mr. Sykes, for their many and valuable contributions to this volume, especially in photographs and maps. Their best results were generously and unreservedly placed at my disposal, and he who reads will appreciate their value. Mr. Sykes has mapped the Pinacate region *absolutely for the first time;* and there are at least three men who are ready to vouch for the accuracy of his work.

We are greatly indebted to the Mexican Government for the authority so graciously and promptly granted to enter Mexico with our outfit, and also to President Roosevelt and our Department of State for kindly and opportunely bespeaking that favour for us.

W. T. H.

New York, June 15, 1908.

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CAMP-FIRES ON DESERT AND LAVA

Pinacate Beetle (*Eleodes armata*)

The "Bug-that-stands-on-his-head"

CAMP-FIRES ON DESERT AND LAVA

CHAPTER I

MOVING PICTURES OF THE IRON TRAIL

Pinacate, the Mystery—A Desert Experience and an Exploration—Dr. Daniel Trembly MacDougal—Moving Pictures of the South-west—Four State Corners in One Day—The Threshold of the Great Desert Region—New Mexico—Two Oases—El Paso, and the Small Rio Grande—The Dreariest Deserts—Arrival at Tucson.

To every intelligent human being—so far as heard from—there is something fascinating in the idea of exploring the unknown and mapping the mysterious.

Dear Reader, would you like a swift flight over a south-western wonderland, that to you and to me will be like a visit to another world? Would you be pleased to go where everything is strange and weird and different? Would you like to go hunting in the most wonderful desert region of all America, visit an odd Mexican oasis, and play pathfinder to grim and blasted Pinacate? Then come with me: for this time the game is worth the candle.

It is not yet a calendar month since we struck *He*-la Bend (they *spell* it G-i-l-a), after a glorious month on the trail and in camp, and climbed aboard the Golden State

Limited. We were half dead with strenuous exploring, but serenely happy in the possession of countless treasures stored up for future enjoyment.

That jaunt was undertaken as a particularly choice desert trip, combined with some actual exploration in a land of absolute mystery, and hunting such as the red gods might permit. For more years than one likes to confess I had longed to become acquainted with the great south-western desert region, and had suffered mortification because so many years had passed over my head without an opportunity to do so. But to him who waits with Determination, all things come to pass.

On a whizzing cold night in January, 1907, Dr. Daniel Trembly MacDougal said to me:

"Look here! I wish you to go with me on a fine desert trip, in the near future; and I also wish you to know that there are mighty few men whom I ever invite to go with me into the deserts. When I say that I would really *like* to have you go with me, *I mean it!*"

Recently Dr. MacDougal was the Assistant Director of the New York Botanical Gardens. He is now Director of the Department of Botanical Research of the Carnegie Institution of Washington, with headquarters at the Desert Botanical Laboratory, Tucson, Arizona. He is a botanist of distinction, a desert specialist of the first magnitude, and a jolly good fellow all the time and everywhere. It seemed to me that my Hour had at last arrived. In one fleeting moment a compact was closed and the event fixed. After long and careful deliberation, we decided to go overland from Tucson to Sonoyta,

Mexico, and explore the unknown country round about Pinacate Peak.

Pinacate, the mysterious! On two or three maps it appears as a small blotch in the midst of a great blank. On two of those maps it is far out of its proper place. Admiral Dewey, when a commander, surveyed the Gulf of California, and from the deck of his ship located the peak with very fair accuracy. For two hundred years of historic times the country surrounding Pinacate has been totally unexplored, and wholly unknown save to a few Papago Indians, and possibly one or two local Mexicans who are unknown beyond the Sonoyta Oasis. And yet, curiously enough, Sonoyta has been known and occupied by Mexicans for at least two centuries.

Why, we asked each other, is the Pinacate region unknown? Why is it that no American traveller, no explorer, geographer, sportsman or naturalist ever has set foot in that area, nor mapped its mysteries? Why is it that no white man outside of Sonoyta knows where the lower half of the Sonoyta River runs? Some one has said that the river runs north of the mountain, and two maps show it that way; but *does* it? And where does it end? It must be a terribly difficult region to have so long remained unmapped. We reasoned that the absence of water was at the bottom of the well of mystery.

From January until October Dr. MacDougal's constant efforts at Tucson failed to find even one man who ever had been through the Pinacate region, or who knew how to reach the mountain. The report of the last International Boundary Commission—an admirable series

of maps and documents—contains only one three-line reference to Pinacate.

And so it was that up to November, 1907, the Sphinx of Pinacate had not spoken, and the mystery remained. On November 2—but let us not ignore the ante-chamber to our Wonderland. There are many things of interest this side of Tucson, and a few that we cannot ignore. From Topeka to Tucson (not *Tuck'*-son, but Too-*sohn'*) the moving pictures are well worth while.

It is in southwestern Kansas that one sits up straight and begins to take note of the flight of the world. When the Golden State Limited of the luxurious Rock Island route has passed Alma, perceptibly loses its speed, and for five minutes or more runs slowly, you notice that something new is happening. It is the southern watershed of the Kansas River, and in about ten miles it rises nearly 400 feet. The beautiful maples and cottonwoods of the Kansas valley disappear actually before your eyes, and a vast stretch of smooth and almost treeless prairie rises like magic.

The engine labours, but half speed is the only result. As you crane your neck around the north-eastern corner of the observation car to look ahead, you see black smoke, a black mass of iron and a siding. Presently, like a wounded snake, the train drags its slow length along, and passes a big, rusty, untidy-looking locomotive that stands alone on the side-track, like a solitary buffalo bull with his old coat but half shed. Its iron sides are patched and stained with rust, and it looks as if not having seen the inside of a round-house for a year and a day.

As the last car clears the end of the switch we notice that a man stands there, and with some haste the switch is thrown. A moment later the towering black mass glides out upon the main track, pauses an instant, then comes rushing after us.

The old buffalo bull is charging us!

Puffing and snorting, he rushes up close, thrusts out a tongue of steel, and licks our coupler. A grimy keeper waves an arm. The old bull bellows twice, then, *bang!*—we are butted straight ahead. Our train starts forward at twice its former speed, regardless of the grade.

Mile after mile we go, our black helper puffing and swaying until at last we reach the top of the water-shed at Alta Vista. There the old buffalo withdraws his tongue, shuts off his steam, and halts to wave a black smoke-wreath in farewell. It was a long climb, and the roof of Kansas now looks very bald, indeed.

In one short half day on the Sunset Limited you see Kansas, Oklahoma, Texas and New Mexico, and the flatness of the world at those four corners is really beyond compare. Mile after mile and hour after hour there is naught but treeless prairies, as level as a lake. Any land ten feet high would be a hill of notable proportions. There are no hills; but there are farms by the thousand, each tiny wooden homestead marked by its own indispensable windmill. Once I counted twenty-four windmills in sight simultaneously on the eastern side of the line, each one a monument to agricultural endeavour.

Although very new, the country looks decidedly prosperous, for the dwellings are painted, and the barns and

sheds are—for a new country—luxurious. The young trees, that nearly always furnish a setting for each homestead unit, even now are very much in evidence. At present, to a lover of pastoral scenery, the country looks a trifle monotonous and uneventful, but in the season of green things it must make a really beautiful picture of thrift and prosperity.

It is good to see people scattering thus over the face of Nature, and by strength and keenness winning for themselves good clean homes and independence, instead of piling up like senseless human sheep of one idea, as do so many millions of people in the congested East. Every effort at making a farm, a ranch and an independent, self-supporting American Home is entitled to the highest respect; and as the train speeds by the checkerboard farms of Oklahoma and adjacent states, we wish the home-makers God-speed with all our hearts.

But this picture soon dissolves from view, and we enter the great arid region of the South-west. Speaking generally, we may say that the deserts of eastern New Mexico begin a few miles south of the town with the melodious Indian name of Tucumcari. Here ends the farm, and here begins the ranch, the naked and rocky buttes, and the gray and melancholy wastes of low mesquite and greasewood brush. Here begins the always-green yucca, or "soap-weed," * which looks like an understudy of the well-known but more robust Spanish bayonet. It stays with us more or less continuously to the eastern line of Arizona, where it ceases to be a notable

* *Yucca radiosa.*

feature of the desert vegetation. It reaches its zenith just north of El Paso, where over hundreds of acres it grows so thickly and luxuriantly that it has the appearance of being cultivated. What a pity 'tis that this thrifty plant is of no important use to man!

For some distance down from Tucumcari, the agricultural energy of the north has overflowed on the deserts of New Mexico; and on many odd bits of debatable ground, beside hopelessly inadequate water-holes, plucky men and lonesome women are striving to create homes and land values, and rear stock. Here you see the first signs of the great struggle between Man and Desert which is going on over a wide empire of territory stretching fifteen hundred miles from western Texas to the Pacific Ocean. This is now our Irrepressible Conflict; and its features and phases are of very great interest and importance to this nation.

Not far below Tucumcari you see the first adobe houses, quickly picked out by their flat tops, their walls of brown earth, their tiny windows and meagre dimensions. To this day I am wondering how on earth those practically level earth roofs ever shed rain. We can understand their small windows, because in this midsummer glare of 130 degrees Fahrenheit, the darkness of those earthen boxes is much cooler, or, I should say, a little less fiercely hot—than would be a well-lighted room.

Three-quarters of the way down the eastern desert of New Mexico we come to a practical demonstration of what water can do for aridity. At Tularosa there appears, a mile away to the eastward, and seemingly at the

foot of the Sierra Blanca, a mass of green jungle stretching away north and south. There are at least half a dozen shades of green in that lovely bank of foliage, and in front of it lie level meadows of alfalfa as green as the finest malachite. This means irrigation.

By way of contrast, the brushy desert on the other side of the railway stretches away twelve miles to the west, dull and hopeless, until it meets the waves of a billowy desert called the White Sands, that seem to wash the eastern base of the San Andreas Mountains. That desert of glistening white gypsum sand-dunes is a surprising feature. With our glasses we try hard to get the details of its waves, and the bits of plant life that seem to float upon it like so much wreckage on a heaving sea. The glistening strip of sand—about eight miles wide—seems brilliantly white in contrast with the dark gray desert in front and the gloomy mountains beyond. They say that under the action of the prevailing westerly winds it is slowly moving eastward.

But the Tularosa Oasis is only a curtain-raiser to what lies thirteen miles beyond. At the western foot of the really imposing Sacramento Mountains lies Alamogordo, and there the train halts with a thrill of pride that vibrates clear through it from cow-catcher to rear platform.

"Trees! *Trees!* Look at the Trees!

"And water! *Running* water!

"Is that an orchard?"

"By all the powers, it is a public Park!"

"Then where is the Zoo?"

"Right over yonder. Get onto that live bear!"

It was all true, as set forth in the exclamations of the alighting passengers. There was really a public park of unknown acres of cottonwood trees set in rows, with running water close beside them laving their greedy roots. Between the tree-rows grass grew. Yes, there really *was* a live zoological black bear, in a very good wire cage, on public exhibition; and we respectfully remind the world that a zoological park is the high-water mark of civilization.

Alamogordo is truly an oasis of the first water. The enacting clause of this pretty place comes from the Sacramento Mountains, on the top of which is the summer sanitarium and refuge of El Paso at Cloudcroft, twenty-six miles up by rail. In this oasis are grown fruits, alfalfa, shade trees and vegetables galore.

On the station platform, a sad-visaged Mexican of Indian descent was selling apples that were as yellow as gold, three for "dos reales" (twenty-five cents). So great was the novelty of golden-yellow apples for sale *in a desert* that the stock went off like a shot. Long live Alamogordo; and may it escape the fire that usually wipes out every frontier town at least once.

The country immediately north of El Paso is picturesque, but sadly desolate; and El Paso itself seems like a city that has been built in cheerful defiance of all possible discouragements. The size of it, and the seriousness with which it has been made, are amazing; but the ride in to its Union Station is certainly the slowest railroading on earth. It seems like four miles an hour; but I would not do even a railroad an injustice, especially in Texas.

In ten minutes all my preconceived expectations regarding the Rio Grande, the bridge across it, and the Mexican shore, were rudely wiped off the slate. Instead of low banks, a wide river-bed, a long bridge and a flat hinterland in Mexico, everything was exactly the opposite. The banks were high, the river runs through a very decided gorge, both stream and gorge are absurdly narrow, and the bridge is ridiculously short. I did not measure it, but the stream *looks* about four hundred feet wide. The White River at Indianapolis is nearly double the size of it. But we must remember that *any* river in a dry land is a Great Thing, and deserves to be made much of; so we forgive the Rio Grande for not being quite so Grande as imagination called for, and accept it as the biggest thing of the kind between the Mississippi and the Colorado.

After a very brief "*pasear*" * across the corner of Texas, we are again in New Mexico, and the deserts are dreary enough. The only interesting plant is the yucca, and the attempts at ranching and stock-raising are so difficult they make one feel sad. The worst of it is, irrigation seems only a dream, for there is no water anywhere that by the wildest stretch of the imagination can be called available for anything outside the narrow strip of lands close beside the Rio Grande.

Strategically, it is all right for the finest desert region in Arizona to burst upon us in the purlieus of Tucson, after we have left the Golden State Limited. But it is

* In northern Mexico, a pleasure trip of any kind is lightly spoken of as a "pas-e-ar'"—a Spanish word that means "walk."

rather hard on Tucson that no one can take it or leave it save in the smallest and most gruesome hours of the night. Going or coming, the train passes through between one o'clock and three A.M., provided the trains are on time. There is no such thing as making two daily visits to the depot to see the trains come in; and the habitant with time on his hands loses much.

By good luck, our outward train was nearly four hours late, and we slept the night through until gray dawn. Then we alighted *in a rain*, if you please, and found the streets delightfully muddy! In the immortal word of our most-recently-arrived English cousin, "Fahncy!" Mud in Arizona!

Taking it as a good omen, we domiciled at the Santa Rita (very well, indeed), rang up the Doctor on the telephone, and dared him to come on with his old outfit and make good.

CHAPTER II

TUCSON, AND THE DESERT BOTANICAL LABORATORY

The Amphitheatre of Tucson—A Demoralized Compass—The Santa Cruz River—The Flavour of Mexico—The Yaqui Indian and His Industry—Impressions of Tucson—The University of Arizona—The Hand of the Carnegie Institution of Washington—The Desert Botanical Laboratory, its Plant, and its Problems.

A WIDE-SPREADING, wide-awake little city on a level, sub-tropical plain that is encircled by granite mountains; a city with a strong Mexican accent, a city neither fast nor slow; a city with wide, clean streets, good buildings, abundant electricity and all the respectable concomitants of a metropolis—this is Tucson, Queen City of cactus-land.

Its elevation above the sea is 2,200 feet.

The ampitheatre of Tucson is thoroughly satisfactory. The plain lies as level as a lake, and it is almost encircled by steep and rugged mountains of gray granite that seem to rise only just beyond the corporate limits. North-eastward the splendid mass of the Santa Catalina Mountains looms up grandly, its highest peak only seventeen miles from the University. Eastward and a little farther away is the hazy-blue Rincon Range. Westward rises the brown and mostly bare Sierra Tucson, and in the north the view is bounded by the Tortolitas. The very nearest

mountains of all are Tumanroc and Sentinel Hills, which actually rise and shine almost within the city limits.

The Southern Pacific Railway flows through Tucson from south-east to north-west. As an engineering proposition it is easier for it to go through passes on a dead level than to climb mountains; but as a base line for a stranger it is a dismal failure. In no other city of my acquaintance are the points of the compass so horribly wrong as in Tucson. I think it would take me about ten years to become reconciled to the wild antics of the magnetic needle in that otherwise sober and steady spot.

The brave little Santa Cruz River which attempts to run through Tucson, but is held up and robbed at every turn, actually rises in southern Arizona, but makes a loop away down into Mexico, below Nogales, nearly a hundred miles away. It seems strange that a stream so very small could come so far alone through the desert without getting lost. But this is a land of queer things.

When you land at Tucson, in the cold gray dawn of the morning after, the first man to welcome you is a half-Mexican carriage driver (there being no such thing as a "keb" in the Real West), and thereafter, about every other man and woman is like unto him. After the disgusting Bowery English of New York in the mouths of swashbuckling drivers, conductors and shop-girls of a hundred kinds, it is really a pleasure to strike something less raucous in sound and in sense. The Mexican may have his faults, but his language does not grate on the ear like the filing of a rip-saw.

Yes, Tucson is full of Mexicans, both pure-bred, Indian and American mixed. You meet them almost everywhere, and every one of the dozen or more who were called upon to render service to us proved eminently satisfactory. I am told that many Yaqui Indians come from Mexico up to this city, hire out as labourers, and work hard to earn dollars, to buy Winchesters and cartridges, to take home by stealth, to use in the killing, quite impartially, of both Mexicans and Americans. Going or coming, the Yaqui Indian is a tough citizen, and the quicker the entire tribe is extradited to the happy hunting grounds farther south, the better for Mexico.

Although Tucson is a city with a flavour of Mexican chillis, externally it does not look it. It is thoroughly modern, with adaptations to the climate. Its beautiful Carnegie Library, its State University, its imposing Santa Rita Hotel of Spanish architecture, its hospital and its schools speak to the Discerning of modern thought and enterprise. True, the absence of ten thousand vacant "lots" covered with twenty thousand tons of ghastly rubbish makes a resident of New York feel very lonesome; but, then, Tucson is new, and the herds of human cattle from the overcrowded cities of southern Europe have not yet arrived.

It may be that Tucson has its seamy side—its midsummer heat, its dust, dryness and perspiration, its too much this or that; but in November, A. D. 1907, everything was as it should be. The whole city was very much to our mind; and we do not even lay up aught against mine host of the Hotel Santa Rita who, when requested

to get up a special course dinner for six gentlemen, was utterly unable to do more than lamely offer the bill of fare in evidence, and stand pat. He did not seem to know how to lure a tenderfoot by subtle degrees of temptation from his proposed $2.00 per plate up to $5.00 and make him pay for the experience.

We found the sister of Tucson Jenny in the dining-room of the Santa Rita. Her smile was bright, and her hair was the colour of the lava on the hill above the Papago Tanks. Mrs. Rucker, of the O. K. Restaraw, had left town, but a little later on, at a most important crisis in our lives, we found her in Hela Bend.

If it is good to make two blades of grass grow where only one grew before, surely the men who make a University in a desert shall acquire Merit, and deserve much from their fellow-men. Even in the rainy and productive states, the making of a seat of learning that shall endure is no child's play; and the taking of a hundred acres of waterless gravel and creosote bushes, and creating thereon a genuine University, with various schools, is an achievement that fairly challenges our admiration. Full of enthusiasm, we started out by electric car to penetrate those classic walls, felicitate President Babcock, and gloat over Mr. Herbert Brown's admirable museum infant; but our joy was short-lived. Dr. MacDougal presently confessed that he had pledged that I should talk to the students from eleven o'clock until noon—and he had almost forgotten to mention it to me until it was all over! When this calamitous situation burst upon me, my first thought was of flight; but afterward I decided that, being

in Arizona, I must emulate Dave Tutt of Wolfville, and for once try to be "a dead-game gent."

Despite the terrors of the rostrum, it was a pleasure to see the bright-faced, open-eyed young people, co-eds and others, who filled the chapel very full, and bravely took their medicine.

I like the small colleges and universities of the bounding West; for verily, their work is just as great as is that of the great universities of the farther East.

Once upon a time the Carnegie Institution of Washington decided that the vast arid regions of the south-west needed a laboratory devoted to the study of the physiology of the plant life of the deserts—or words to that effect.

Having the price safely cached in Hoboken, the Institution looked about for a Man. It found Dr. Daniel Trembly MacDougal, then Assistant-Director of the New York Botanical Gardens. There being no rival or second choice, nominations were closed, and he was unanimously elected Director of the Desert Botanical Laboratory, to be.

In due course, Dr. MacDougal intimated to the proletariat of Tucson his belief that the D. B. L. might do worse than settle in their midst. Forthwith, the Tucson Board of Trade carried the botanist to the top of a high mountain close by, and showed the world that lay at his feet.

"All this," said the Board, "shall be thine, and more, if thou wilt pitch thy tent herein, and become one of us."

A mountain of many moods and tenses, and a belt of plain around it, both of them covered with weird things with stickers all over them, was offered, as it were, on a

Dr. Daniel Trembly MacDougal

In the garden of the Desert Botanical Laboratory, with a Tree Choya (*Opuntia versicolor*)

silver plate. Inasmuch as the site was the finest bit of real estate for the purpose in all the south-west, Tucson's offer was blithely accepted; and thus was born into the world the Desert Botanical Laboratory.

Behold, then, at the western end of Main Street, a rugged gray hill eight hundred feet high, its summit crowned even to-day by the rough stone parapet of what once was an Indian fortification.

As we drove briskly westward on Main Street, crossed the Santa Cruz River almost without knowing it, and approached the foot of the botanical mountain, I framed up a foolish question. I was about to say, "Why are your fence posts so *tall*, and so irregular?" But for once I wisely held my peace; and presently it was clear that all those seeming tall straight posts running up the mountain on the southern sky-line were giant cacti, without side-arms. They stood all over the plain, and climbed up all sides of the mountain, quite to its summit. The stony sterility of the steep slopes easily accounted for the absence of branches; for both soil and water were there reduced to their lowest common denominator.

North of the botanical mountain, and also within the sheltering steel spines of the wire fence, there lies a glorious stretch of level valley, of good soil, and good water when water is falling. And, dear Reader, a word in your ear. If you care aught for the botanical wonders of the Arizona deserts, it will pay you as you hie westward to stop off at Tucson, regardless of bad hours, and spend half a day in the Desert Botanical Laboratory's nature garden. Truly, it is a botanical garden, an epitome of

the wonderland of arid vegetation that stretches from Tucson a good hundred miles westward. There will you find the stately giant cactus, the choya—or "cholla"—of evil reputation, opuntias galore, the lovely palo verde, the tough mesquite, the omnipresent creosote bush, and the most remarkable fortification of a pack rat (*Neotoma*) that can be found in forty leagues of travel.

On a shoulder of the mountain, about half-way up to the summit, stands a spacious building of rough stone, gathered and hewn on the premises, which is the Laboratory de facto. It is a hundred and twenty feet long by thirty wide, and from vestibule to back stairs it is truly something new under the sun. Here are studied the ways and means of the desert plants: their roots, their stems, and their leaves when they have any; their powers of absorption and retention of moisture; their fate in various soils; the effect upon them of unusual humidity; the transplantation of desert species; and goodness knows how many other things. A member of the staff, Dr. Livingston, was just then putting the finishing touches to an instrument invented by him for the easy and sure determination of the amount of moisture in any desert atmosphere; and duplicate copies of it were about to be distributed for use in various scientific institutions throughout the arid region.

"Do you see that tall, light-coloured peak over yonder?" said Director MacDougal, pointing north-eastward across the valley to one of the highest peaks of the Santa Catalinas.

"Yes."

"That is Mount Lemmon, and to the foot of that peak is seventeen miles, as the raven could fly if he wished. Within a mile of the foot of that light-coloured wall of rock we have an experimental mountain plantation, in the pine belt, at an elevation of 8,000 feet. We have had to put a good wire fence around it to keep the deer and mountain sheep from browsing on our experiments!"

"And just what is it that you hope to accomplish with this new botanical plant?"

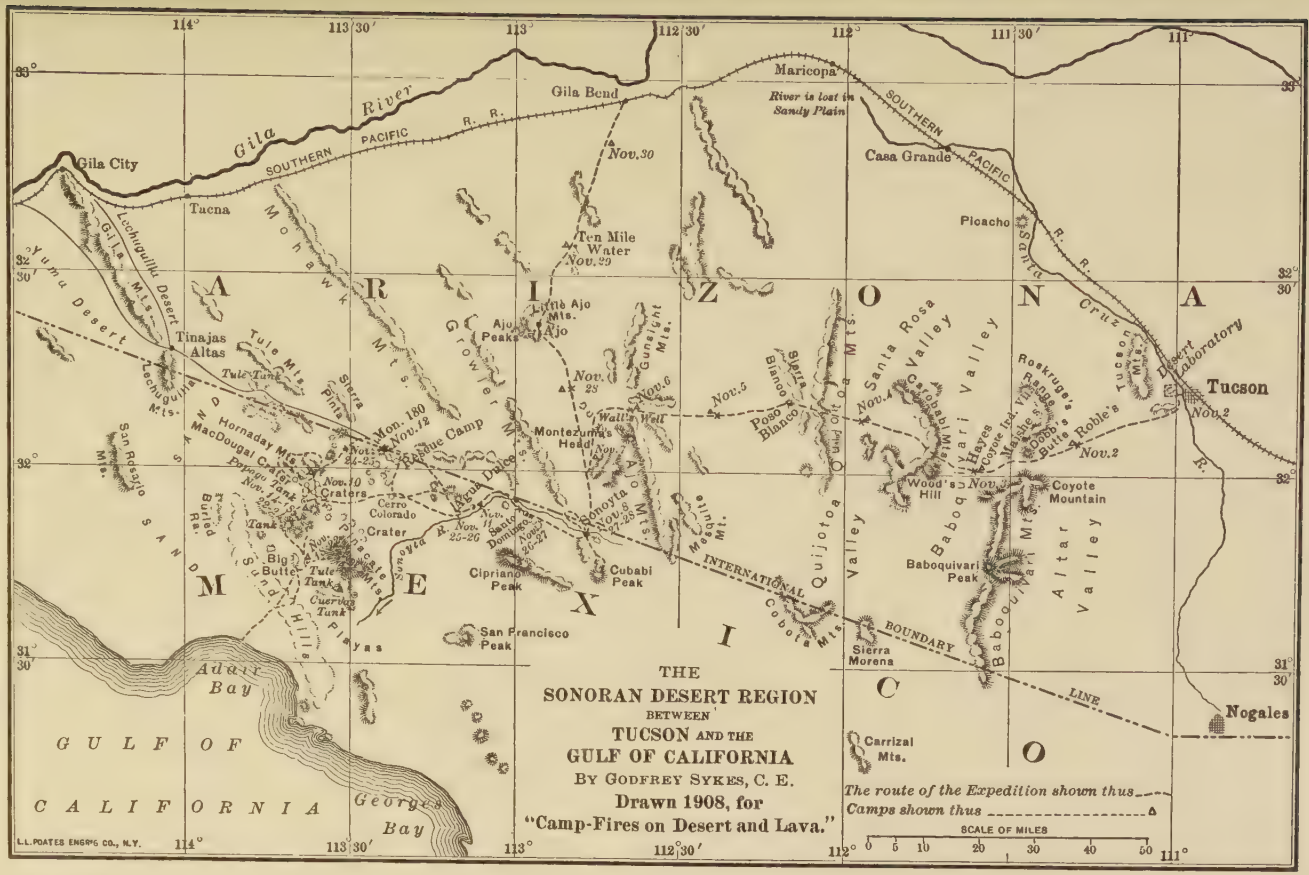
"We are studying the conditions in order to learn the forces that have been concerned in the origination of these desert forms, and the principles which control their distribution and existence at the present time. Our results may materially modify many of the major conclusions of botanical science. The prevailing generalizations are mostly based on a study of plants of the tropic and temperate zones, made indoors, while our work is in the midst of an undisturbed vegetation, and among types but little known. The results will depend entirely upon what we find out that is new and hitherto untried. At present we do not expect to conduct extensive practical experiments here. They naturally belong to the state and national experimental stations. Our work is to furnish them with new facts, and with theories to try out."

With the thousands of square miles of fertile deserts in our south-western empire—deserts which to-day are green all over with their own peculiar but economically valueless desert flora, and only waiting for valuable plants that are as tough as the mesquite and creosote bush, it is well worth while for the American people to enter more

seriously into the problems of the arid regions. Water is not necessarily the only thing that can make a desert of first-class use to man. Perhaps there is much to be done with plant life alone.

It is the view of at least one layman that when the Carnegie Institution of Washington took up the problem of the deserts, chose Dr. MacDougal and established the Laboratory at Tucson, it did the best piece of work for Pan-America that it has done thus far. It seems to me that we should not expect much in or of the mountains of Arizona, except prospect holes, "mines" and mining companies in endless-chain rotation. Steep-sided pyramids of bare granite and hills of bare brown lava can hardly be made to bloom with roses; but with the level floor of fertile desert that covers four-fifths of Arizona and New Mexico, it needs no great wisdom to inspire the belief that much may yet be done.

> "I am the Desert; bare since Time began;
> Yet do I dream of motherhood, when man
> One day at last will look upon my charms,
> And give me towns, like children, to my arms."


THE
SONORAN DESERT REGION
BETWEEN
TUCSON AND THE
GULF OF CALIFORNIA
BY GODFREY SYKES, C. E.
Drawn 1908, for
"Camp-Fires on Desert and Lava."
The route of the Expedition shown thus
Camps shown thus
SCALE OF MILES
0 5 10 20 30 40 50
L.L. POATES ENGR'G CO., N.Y.
ARIZONA
MEXICO
Gila River
Gila City
Tucna
Gila Bend
Maricopa
River is lost in Sandy Plain
Casa Grande
Picacho
Tucson
Nogales
SOUTHERN PACIFIC R. R.
Yuma Desert
Tinajas Altas
Mohawk Mts.
Growler Mts.
Ajo
Little Ajo Mts.
Ajo Peaks
Gunsight Mts.
Montezuma's Head
Rabbit Camp
Sierra Pinta
Tule Mts.
Tule Tank
Hornaday Mts.
MacDougal Crater
Cerro Colorado Crater
Big Butte
Tule Tank
Cuerbito Tank
Pinacate Mts.
Pinacate Hills
Playas
Adair Bay
GULF OF CALIFORNIA
Georges Bay
Sonoyta R.
Sonoyta Mts.
Cipriano Peak
Cubabi Peak
San Francisco Peak
Quijotoa Mts.
Quijotoa Valley
Sierra Blanca
Posa Blanca
Santa Rosa Valley
Cababi Mts.
Hayes Mt.
Roskruge's Range
Roble's Butte
Tucson Mts.
Desert Laboratory
Wood's Hill
Coyote Mountain
Baboquivari Mts.
Baboquivari Peak
Altar Valley
INTERNATIONAL BOUNDARY LINE
Cobabi Mts.
Sierra Morena
Carrizal Mts.
Nov. 30
Nov. 29
Nov. 28
Nov. 27
Nov. 26
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Nov. 20
Nov. 19
Nov. 18
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Nov. 12
Nov. 11
Nov. 10
Nov. 9
Nov. 8
Nov. 7
Nov. 6
Nov. 5
Nov. 4
Nov. 3
Nov. 2
Mon. 180
Ten Mile Water
Wall
Crater
Tank
Playas

CHAPTER III

TRAILING INTO A NEW WORLD

Our Social Register—A Model Outfit—A New and Different World—An Encounter with Indians—Our First Accident Averted—A Cattle Ranch Around a Desert Well—Animal Life of the First Day—The First Camp-Fire.

On the morning of November 2 our outfit was assembled in the compound of Dr. MacDougal's bungalow, near the University, and I opine that it was as nearly perfect as any that ever took the trail in Arizona.

As became a party bent on a serious exploration, the personnel of the party showed a wide range of talent. Categorically, the following were among those present as we trailed from Tucson 140 miles down to Sonoyta, Mexico:

Dr. D. T. MacDougal, commander-in-chief; botanist, expert photographer, sportsman—and a *mighty* good shot with his old Winchester carbine.

Mr. John M. Phillips, of "Camp-Fires in the Canadian Rockies," and Pittsburgh; iron manufacturer, Pennsylvania State Game Commissioner, expert sportsman, and expert photographer of everything in general.

Mr. Godfrey Sykes, the Arizona Wonder; formerly of England, now Superintendent of Buildings and Grounds, and Right-Hand Man, at the Desert Botanical Labora-

tory; official geographer to the expedition; also civil engineer, mechanical expert, wonderful wagon-fixer, and very agreeable gentleman.

The Present Incumbent; zoologist and chief taxidermist; sportsman; and amateur photographer on the side.

Frank Coles, of Tucson; wagon-master, chief packer, and cook.

Jesse T. Jenkins of Tucson; general assistant to Coles; ex-Texas-cowboy; good story-teller, and permanent jester to the outfit.

Charlie Foster, a Mexican from Sonoyta, whom Jeff Milton, our friend of the Boundary, had sent up to pilot us down to Sonoyta. He rode his own horse, and always went ahead, to show us what roads not to take. He saved us much mental wear and tear, and possibly more.

The Bay Team; wheel-horses to the White-Water touring car, and a little thin to start with.

Bill and Maude; a pair of small mules, one size larger than jack rabbits, the leaders for the White-Water. They were far too small for the wheelers.

The Black Team, consisting of a rather lazy horse and a wildly ambitious and beautiful young mare, drawing the runabout.

Bob, an inexperienced young dog with a fox-terrier strain, belonging to Frank Coles, utterly devoid of savvy, and always in trouble. At the outset he seemed to be all right as a possible camp-dog, to chase away skunks and coyotes; but he was far from wagon-wise, and got hurt twice. But there are worse dogs than Bob; for he was an affectionate little soul, and he knew enough to let a

bandage stay on his leg unchewed, until taken off by the head nurse.

But for Bill and Maude, I think our outfit would have been quite perfect; and the only trouble with them was that Nature cut them after a horse pattern that was decidedly too small.

Our leading vehicle was a four-horse-power White-Water touring car with an automatic tonneau, a spring seat, a canvas cover and four superfluous bows. This regularly carried a ton of freight, a chauffeur, three men, forty gallons of water, a dog, and half-a-gallon of small stones on the running-board to throw at "Bill." After this came a two-horse-power runabout by Callahan, with a canvas top, half a dozen cameras, six guns, four bed-rolls, two live men and eight dead quail. Safely cached in various parts of the above cars were four saddles and five pack-saddles, for use on extra horses and mules that were awaiting us in Sonoyta.

Our outfit had been most carefully made up by Dr. MacDougal and Mr. Sykes, and the greater portion of it came out of the regular desert-exploration equipment that has been accumulated by the Laboratory for official use.

Next to our own food and the horse feed, the most important item was four light wooden cases, each containing two five-gallon cans of tin, made square, like kerosene cans, to carry forty gallons of water, and be handled with celerity. Each member of the party provided for himself a sleeping-bag, or bed, of the type that most strongly appealed to him. Each of the four principals carried his individual canteen, rifle, binocular, camera and medicine-

box. When we made up our pack-train at MacDougal Pass for the last dash to Pinacate, my entire outfit weighed 52 pounds, that of Mr. Phillips 48, Mr. Sykes' roll scaled 43 and Dr. MacDougal took first prize with a package weighing—without his camera and fixings—only 36 pounds.

But I anticipate. During the first days on the trail, the outfit of a large party does not immediately resolve itself into its component parts. It takes time to bring out the little mysteries and surprises that have been hidden in the depths of war-sacks, for production in times of stress and peril. Now, that special ten pounds of luncheon chocolate which Mr. Phillips thoughtfully bought and cached in the load on the sly, certainly did save our lives, several times each, in the awful lava beds around Pinacate.

When you take the trail westward from Tucson, and begin to look upon undisturbed Nature, you quickly realize that the world is different. Everything is not only new, but totally strange. By the time you have walked ahead of the outfit to the summit of Roble's Pass, with Tucson Mountain looming up on your right, you are ready to exclaim,

"This is another world!"

There is not one familiar-looking rock, plant or tree!

But for the fact that the giant cacti which stand all over the mountain-sides like silent sentinels are pale green instead of gray, they would resemble the dead tree-trunks of a burnt-timber district; but their healthy green colour and their accordion plaits give them an appearance of good health and prosperity that forever removes them

from the dead-tree class. Here at Tucson, the giant cactus, or saguaro (sa-war'ro) develops few branches, and on the bare rocks of the mountains the limbless, straight stem is the rule. It is this strange plant, more than any other, that gives the key-note to the landscape, and that most strongly impresses upon the mind of the traveler the fact that *this is another world!*

During our ten-mile ride and walk through the main pass of the Tucson Range the giant cactus grew in great abundance. In the arroyos, in the pass and on the mountain-sides they grew literally everywhere—thousands of them. Many of them were very large, and well branched. The branches run all the way from round green knobs the size of a foot-ball to massive branches twenty feet long and as thick through as a man's body. The variety of arms is simply endless. It would take a string of about seven figures to represent the number of variations in giant cacti that we saw between Tucson and Sonoyta. But it was not in the Tucson mountains that we found this splendid creation at its best. That came a few days later, and I had a flash of genius when we came to the very finest one—which will be set forth anon.

The giant cactus prevailed throughout the ten miles of Pass through the Tucson Mountians, but as soon as we reached the level floor of the desert it stopped abruptly, and we saw it no more until the next mountain chain was reached. Locally, and in Mexicano, it is known as the saguaro; and that name is also spelled sahuaro.

A brisk ride of about four miles down grade from

the summit of Roble's Pass brings the outfit down to the main floor of the desert, at the eastern edge of the Avra Valley. But where is the barren, lifeless waste of drifting sand, desolation and danger that naturally rises in the mind of the uninitiated reader whenever deserts are mentioned? Clearly, it is not here.

We see ahead of us, stretching away mile after mile to far-distant ranges of hazy-blue mountains, a vast plain, level as a race-course, but completely covered with cheerful-looking verdure growing about waist high to a man on foot. Instead of being a gray and melancholy waste, however, like the sage-brush flats of Montana and Wyoming, this great garden is *green*—persistently, cheerfully, even delightfully green! And you do not see anywhere even so much as half an acre of perfectly bare and verdureless ground. True, there is bare ground *between* these green clumps of creosote and mesquite bushes; but that is only a bit of novelty in Nature's planting scheme.

How very unlike the desert of our expectations! Let us call it, for truth's sake, an arboreal desert.

By the middle of the afternoon we were in the middle of the vast green plain that lies between the Tucson Mountains and the Coyote Range, twenty-five miles to the south-westward. The sun was then at its hottest, and the party was drinking heavily. No one was openly complaining of aught, however, and everything was going bravely on until two Papago Indians were seen coming toward us on the trail, driving a wagon loaded with—watermelons!

Instantly each member of our party was galvanized into a state of wild activity. Weapons were unlimbered, and cartridge belts were robbed without mercy. No one openly proposed bloodshed, but it was plain that each man had resolved that the coming load should not pass by our outfit unscathed. If there must be another Indian outrage, why there was no better place for it than in that silent plain, where graves might be had for the asking.

The unfortunate red men took an inventory of our fighting strength, and made low sounds of despair.

"Hello, there! Stop immediately!" was our command.

The Indians drove out on the south side of the road, stopped their team in échelon, and prepared to sell their lives as dearly as possible.

"Sell us some of those melons, or die!" shouted our war-chief; and the party held its fire, for a reply.

"Two bits! *Muy dulce!*" (very sweet), said one of the Papagoes, as plain as print.

His life was saved. There was a rush to the end-gate of his wagon, and while four men selected melons, the Man-with-Silver dug up coin.

It was a wild, disgraceful orgie. Like a pack of wolves falling upon a wounded antelope, we flung ourselves down in the shade of our wagon, ripped open those helpless melons and gorged. Notwithstanding the heat of the day, they were surprisingly cool—and delicious! Up to that moment we had not realized how hungry and thirsty we were—for watermelons. Like the small boy

with the whole pumpkin pie, the only drawback to their goodness was the fact that they mussed up our ears.

Mr. Phillips was the only man who retained his presence of mind, but we missed him not until we heard the deadly click of his camera.

"Oh, stop that down, and get in here before it's all gone!" cried a friendly voice; and the next moment he was as busy as the rest of us. Bob Dog asked me to give him some melon, and when I did so, he joyously ate a lot of it, and thanked me.

An hour after the watermelon debauch we came ever so near to achieving a serious accident. Jess Jenkins, who was driving the mountain buggy, noticed that the right rear wheel of the White-Water wagon was tracking clear off the brake-shoe, and wabbling. Immediately he rang in an alarm, and it was found that the afflicted wheel was on the point of parting company with the axle, skein and all! It seems that although the wagon was almost new, the skein had worked loose from the end of the wooden axle, and in perhaps six minutes more the heavily loaded vehicle would have crashed down by the starboard quarter.

Then Mr. Sykes took charge of the case. He cut a stout mesquite stem, set it up firmly under the sick axle, then dug a hole under the wheel and took the wheel off. Those who could not help him kept very still, and watched a Master-Fixer do his work. The skein was put back in its place, and fastened so tightly that when all the rest of that wagon goes to rack and ruin, that piece of its anatomy will be found holding firmly in its place. And so, with many thanks to the Fates for letting us off so easily, and

From a photograph by J. M. Phillips

A Lucky Strike in the Desert

Mr. Sykes The Doctor Frank Coles Charlie Foster The Author

From a photograph by J. M. Phillips

Filling the Water Cans at the Papago's Well

to Mr. Sykes for making the wagon as good as new, we drove on, duly chastened in spirit, and wondering what next.

My journal states that on our first day we made twenty-three miles, that for one-half the way the creosote bush held sway, and for the other half the mesquite. With a fine sunset, night closed in upon us when we were yet four miles from water and a possible camping-place. There being nothing to do but to go on to water, we went; and finally, in pitchy darkness, reached the corner of an imposing corral made of mesquite stems. It was then more than an hour after sunset. We were at the cattle ranch of a well-to-do Mexican named Roble, who had digged a big well, found water, erected a big tank of galvanized iron fifteen feet high and constructed a hundred feet of concrete water-troughs for his cattle.

Mr. Roble was at home, and he permitted us to water our horses, night and morning, and burn up two campfires of his firewood, all for the very moderate consideration of fifty cents. Mighty cheap it was, at that price. No one knows better than a desert traveller that, on a desert, a well of pure water is worth money. Unfortunately, however, it is the inexorable law both of Man and Nature that the lower the water the higher the price.

And thus ended our first day in the Arizona deserts. And what animal life had we observed? I will briefly enumerate it.

We saw four Arizona jack rabbits (*Lepus californicus eremicus*), four badger holes, about twenty-five or thirty burrow mounds of the desert kangaroo rat (*Dipodomys*

deserti), three ravens, one desert red-tailed hawk and about two hundred small blackish birds that I could not identify on the wing. We saw a few sparrows and about twenty-five nests of the cactus wren in choya cactus tops. We also noted four yuccas and three white thistle-poppies (*Argemone platyceras*). Of cattle skeletons we saw only four.

When we reached the corner of Senor Roble's stockaded corral—built of mesquite stems, big and crooked and most wastefully piled up between two lines of posts—the night was very black, and at first we did not know which way to move. But in due time the expedition resolved itself into its component parts, and the work to be done was effectively taken in hand. While the drivers and the farm-bred supernumerary unhitched the six horses, Mexican Charlie brought a lot of mesquite firewood from goodness knows where, and quickly built a brilliant camp-fire. And immediately all hands became cheerful and loquacious! If a good camp-fire can not produce comfort and goodfellowship in the open, nothing can.

The horses were led into the corral and watered at the troughs, then given a good ration of oats and alfalfa. When the wagons were unpacked, each man selected a spot for his night's repose, and effectually consecrated it to his individual use by depositing his bed-roll upon it. A cache of provisions is not more sacred in the Far North than is a preëmpted sleeping-place on the desert; and "rank" indeed is the tenderfoot who ventures to tempt the hereafter by jumping such a claim. A man may jump a copper claim, or eke a gold one, without the

painful necessity of being shot; but "bed-ground" is different.

With the growing importance of the camp-fire, the cook's boxes were unpacked, and their cheerful contents displayed to the gaze of an admiring circle of men. A large square of clean canvas was spread upon the sand, and upon it went an array of enamelled-iron plates and cups, loaves of Tucson bread (for two days only) and "air-tights." Two huge slabs of steak were cut from a hindquarter of fresh beef—and it certainly was fried to perfection. The coffee was started early, and achieved a finish at the most auspicious moment.

Inasmuch as that was our first meal since early breakfast, the crowd was sharp set, and the havoc wrought would have been considered appalling if anyone could have spared time to take note of it.

Our first supper consisted of fried beefsteak, fried potatoes, raw onions, bread, butter, coffee, cane-and-maple syrup and plums; and we all pronounced it good. The lovely label on the syrup can had erstwhile proclaimed "Genuine Maple Syrup"; but the pure-food law had got in its nefarious work. In deference to its outrageous and despotic demands, a broad white strip of paper had been pasted, like a surgeon's plaster, squarely across the abdomen of that chastened can, bearing the mournful confession "CANE AND"—so that the label then read "Genuine Cane and Maple Syrup." It was a silent tribute to the pure-food law, the beneficent influence of which now reaches even unto the deserts of Arizona.

Long before bedtime we insinuated ourselves into our

sleeping-bags—in the wide open, because in Arizona tents are mostly useless—with each man lying where he listed. To guarantee that we really were in the wilds, with the starry heavens for a canopy, certain coyotes sang a few bars to us out of the surrounding darkness; and there being no further business, the meeting around that first camp-fire silently adjourned.

CHAPTER IV

FIRST IMPRESSIONS OF AN ARBOREAL DESERT

The Frame of Mind—The Nursery Idea—Strange Association of Plains and Mountains—Desert Amphitheatres—Unique Granite Mountains—The Arroyo and Its Uses—Millions of Specimen Shrubs and Trees—A Flood Basin.

If you enter the deserts to study them, go in a receptive and tolerant frame of mind, or not at all. Said Dr. MacDougal,

"After a month spent in the deserts, you will either love them or loathe them for the rest of your life."

Go with an open mind; for the voices of the arid wastes are entitled to a hearing. If you cannot endure a certain amount of thirst, heat, fatigue and hunger without getting cross with Nature, it is best to stay at home—or go across the water to the Land of the Itching Palm.

If you negotiate a desert voluntarily in order to learn it by heart, prepared to take it like marriage—for better or for worse—you will get on bravely and well; and if camp-dogs and coyotes run over your bed and trample upon your nerves when you are striving to snatch ten or twelve hours of slumber, anything that you may say or do to those chronic disturbers will be regarded as in order.

Naturally, one looks first at the desert as a whole,

before analyzing its component parts, and counting its stamens and pistils. And what is one's first impression?

First of all, you note with profound surprise that these Arizona deserts are not barren and desolate wastes, but literally teeming with plant and tree life. The plain looks exactly like a nursery devoted to but one or two shrub species. According to the water supply, the creosote bushes or the mesquites will be two feet high—all of them —or three feet, or six feet, as the case may be. On different areas the standard of height varies, but on any given plain, as far around you as you can see, the height is remarkably uniform, and the spacing of the clumps is very regular.

Try as you will to get rid of it, the nursery idea sticks in your mind; and the more you see of these deserts, the more fixed does it become. One plain will be found devoted to the mesquite, another to the creosote bush, another to choya cacti, and others, but of smaller area, to the tall and rank galleta grass, with a mixture of other things. And many times, also, will your overland progress lead you to a five or ten-acre tract of desert botanical garden, whereon you will find that Nature has joyously thrown together a fine sample lot of all the species that have been used in planting operations for twenty miles around.

The next impression concerns the strange and even weird association of plains and mountains. For a hundred miles west of Tucson the stage setting is grand and peculiar. The desert is a plain that seems to be absolutely level, but it is so thickly studded with mountain ranges

that every "valley," as they are oddly called, is a great natural amphitheatre, surrounded by rugged mountains. It is a rare thing for the vision to sweep across the green sea of desert verdure straight to a far-distant horizon on the level without encountering a saw-toothed range of bare gray granite. I noted this immediately, and throughout our wanderings in Arizona the clear gaps leading to the level horizon were few, indeed, and very narrow.

Strange to say, there is in those gray mountain walls a sense of cheerful companionship that quite robs the deserts of the awful monotony that usually characterizes uninhabited level plains of illimitable extent. To some minds the idea may seem absurd, but to me the mountain ranges were *company*. The ranges near at hand are always so isolated, so sharply defined, and so individualized that they are as much company to the wayfarer as so many houses with windows that look at you. To perish on a great waste of sand like the Sahara would be very monotonous and disagreeable; but in one of these beautiful green plains, surrounded by an amphitheatre of interesting mountains, death would be quite a different matter.

In about three days' overland travel one is reasonably certain to pass through, or else quite near, at least two or three independent ranges of mountains. By the end of so much travel you have honestly acquired the impression that of all the mountains in the world (s. f. a. k.)* these are the most abrupt risers, and from the levelest plains. Often there are no foothills, no premonitory symptoms of any kind. With one foot on the level desert, you plant the

*So far as known.

other on the steep side of a mountain that towers aloft in one long steep climb from base to summit; and you must climb for all you are worth in order to rise in the world.

These mountains seem like after-thoughts, modelled in the shop long after the general plans were finished, and set up cold. They constantly reminded me of the artificial peaks of stone, or concrete, or furnace slag that have been built in several of the level zoological gardens of Europe for wild goats, ibexes and sheep to climb upon, and get the most for their money out of a small surface area.

Hereafter, whenever a zoological-garden constructor needs to erect a high mountain on a piece of level ground the size of a city lot, let him take as his *motif* and model an Arizona mountain, follow it closely, and if he reproduces it faithfully he shall acquire merit.

I have seen, and at times experienced, mountains in our own grand Rockies, in the Sierra Nevadas, British Columbia, the Alleghenies and Adirondacks, Italy, India and elsewhere in the Far East, but nowhere have I encountered or enjoyed such upright mountains, nor such downright peculiar mountains, as those of southwestern Arizona. If you have not yet seen them to fine advantage, quietly, and continuously for days, as becometh the needs of a lover of natural scenery, then may you live and enjoy life until you have done so.

The mountains alongside our trip, excepting one range in Mexico south-east of Sonoyta, called Cobabi, were rather low, none of them running up as high as 4,000 feet. But what of that? Give a two-thousand-foot mountain a steep face, and a serrated top, and like a climbing woman

Typical Arboreal Desert Plain, and Coyote Mountain

The Trees are Mesquite and Palo Verde. The amount of grass is unusual

with a small income, it can put up quite an imposing outside appearance. None of the mountains between the Santa Catalinas, Sonoyta and Gila Bend were high enough to bear pines, or any species of coniferous trees. They were all of them builded of gray granite, and their steep sides were mostly as barren of trees as the side of a factory chimney.

The fourth feature that impresses a first-impressionist loose in the deserts is the arroyo. Now, in that region, the arroyo is not merely a plain and simple product of nature. It is an institution. Its variety is great and its uses many. As a resource for water it is generally a delusion and a snare; although there are times when it yields the precious fluid that is as necessary to the traveller as his own heart's blood. The trouble is that the water that collects in an arroyo during a downpour of rain is quickly absorbed by the thirsty sands of the stream-bed. The bed of the average arroyo on a desert plain is like an attenuated sponge, ready and eager to absorb the last drop of the struggling current. And the worst of it is, there are no nice pockets lined with impervious clays to hold the water in storage for the Thirsty Ones of the desert. Through the remorseless loose sand and pervious gravel-beds, the water sinks down quickly and far, and is gone forever.

Once as we crossed a broad arroyo in which there were unmistakable signs of moisture from a recent rain, I said to Dr. MacDougal,

"Doctor, in a situation like that, could not a thirsty man-with-a-shovel find water by digging?"

"Oh, yes, if he went down far enough."

"About how far do you think one would have to dig in such a spot as that in order to strike water?"

"Well," said the Doctor, soberly and reflectively, "I should think that he would need to go down about 350 feet."

And the dry bones of my curiosity are there to this day.

The largest mesquite and palo verde trees, and the patches of galleta grass, if there are any, are found in the arroyos. It is beside an arroyo that the desert traveller unhitches his tired horses and makes his camp, for the certainty of good fire-wood, and the chance of a little grass. Even if it is to be a "dry camp," the arroyo is far more hospitable than the small bushes of the plain.

The course of every erstwhile watercourse is always discernible at a mile's distance by the meandering line of green-topped mesquite and palo verde that looms up twice as high as the bushes of the plain. Wherever that green ruching runs, there will you find fire-wood, and possibly other things of equal value. Near mountains, when the water rushes off the granite or lava, the arroyos are fairly numerous, but on the level plains you may sometimes travel five miles without the smallest break.

When we begin to analyze the component parts of the desert—which we do even while grasping wildly at the Thing as a Whole—we immediately notice that it is made like an old-fashioned museum. Each object is an individual specimen, standing on its own solitary pedestal. Each creosote bush, mesquite, palo verde, ironwood, ay,

each clump of galleta grass is a *perfect botanical specimen, growing in its own invisible tub, standing alone, and quite untrammelled by its neighbours.* Out of a million creosote bushes, nearly every one has for its circumpolar regions a zone of smooth, bare earth from two to ten feet wide. The perfectly symmetrical development of each bush and tree on an arboreal desert is a perpetual novelty. Elsewhere we have been accustomed to seeing bushes massed together, with little individuality; and the independent specimens of the deserts are far more interesting. They compel interest in a way that massed bushes never can, no matter what they are. Out here every traveller becomes a botanist (Ld.) because the facilities are matchless and the temptation is irresistible.

The reason for the zones of bare ground between bushes is easily recognized, especially when Dr. MacDougal is at hand to state it. There is not enough water to support a shrub growth that is continuous. The desert rain is sufficient only for one bush every five or ten feet.

The Avra Valley—which farther south becomes the Altar Valley—is, like many others, a vast flood basin into which many arroyos run down from the surrounding mountains only to lose themselves forever. On the plain their waters spread out and are swallowed up before they can run far out and away. The trail across it is a fine wagon road, as smooth and hard as any ordinary road of telford, macadam or gravel. In the first hundred miles of fertile deserts that lie immediately westward of Tucson, loose sand is rarely found. As a rule, the roads over

which we travelled in Arizona, in the triangle between Tucson, Sonoyta and Gila Bend, were excellent; but of course there were some stony sections, some that were sandy, and in some sections there were many arroyos and gullies to be crossed.

It seems to me that the outward route chosen by Dr. MacDougal is exceptionally well provided with attractions. The sights that were in turn interesting, remarkable or entrancing crowded upon us in such rapid succession that it was well-nigh impossible to make a coherent record of them. The country from the Ajo mines up to Gila Bend is far less interesting; in fact, it is little more than creosote bushes and distant mountains. Now, the country between Tucson and Montezuma's Head, at Wall's Well, is a wonderland, no less; and I think that no unjaundiced person can ride over that trail and say otherwise. I regret, however, that it is utterly impossible for any efforts of mine, even though supported by a heavy battery of cameras, to do justice to it in these pages, or in any others.

From a photograph by J. M. Phillips

A Typical Desert Landscape

Giant Cactus, Mesquite Trees, and a Tree Choya, near Montezuma's Head

CHAPTER V

A DESERT BOTANICAL GARDEN

The Lost Cactus Garden—The Beautiful Palo Verde—An Unworked Table Decoration—The Deadly Mistletoe—The Acacia, or "Cat-Claw" Thorn—The Unique and Wonderful Ocatilla—A Bouquet of Green Wands—The Octopus of the Desert—The Iron-wood Tree—The Omnipresent Creosote Bush, and Its Purpose.

On looking over my notes of the things seen on the second day, I find so much that was interesting I despair of finding space for the half of it. What we did was as nothing; but the things we saw would, if adequately set forth, make a volume larger than some that I wot of. Described in a single line, it was a drive into, through and out of a pass between two ranges of mountains; but I just *wish* you had been with us to take it all in! It was really a pity that there were only seven men and a dog to enjoy it.

There is one remembrance of the morning that makes me sigh like a porpoise every time I think of it. My unhappiness is due to the fact that I lost forever the chance to place before the Reader a picture of the most perfect and glorious cactus gardens that we found on our entire trip. Being an old specimen-hunter, with an eye for the "finest of all" the moment it is seen, I spotted the "finest" giant cactus, and the "finest" organ-pipe cactus, the

moment I laid eyes upon them. We captured them, too; as you shall see. When I saw that wonderful cactus garden at Coyote Mountain, specially laid out, planted and tended to perfection by the Divine Hand, I *knew* instinctively that I never would find another equal to it. As I halted the buggy and climbed out with my amateur camera, I shouted to the others an announcement of the discovery. But Dr. MacDougal's camera was buried under a load of outfit, Mr. Phillips was just then starting off after a flock of Gambel quail, and I alone was left to make a picture.

Thus far there has not been time to consider the cacti, of the kinds familiarly known as choyas (spelled "chollas"), for the reason that those terrors of the deserts must be approached with caution, and handled with circumspection. And there is not time for them even now. But there, before Jess Jenkins and me, appeared a level bit of desert the size of a large city block, bare underfoot and clean as parlour floor, on which Nature had put forth a special effort in the development of a cactus garden.

There were four important species, all splendidly represented—the giant cactus, barrel cactus, tree choya and Bigelow's choya, while several ocatillas and an allthorn bush were thrown in for good measure. The sun was at my back, the foreground was bare and vacant—quite as if made to order—and the way the clear sunlight brought out those spiny details was beautiful to see. The million spines of the choyas glistened yellowish-white in the sun, like a million glass toothpicks. The planting was beau-

tifully disposed for a picture, being neither crowded nor scattered.

Mentally praying hard for success, but horribly torn by doubts, I set up my tripod and exposed two films. But in photography the mistakes of Moses were as ciphers to mine. Because I was so anxious, I did something wrong, and secured no pictures whatever.

Half an hour later, when I overtook the four-horse wagon, and related the story of the garden, the others said, "We'll all photograph it on our way back." They meant it; but alack! Fate willed it that we did not return that way; and my wonderful cactus garden remains untaken to this day.

It is impossible for the expedition to proceed any farther without the introduction of the Palo Verde and certain other conspicuous habitants of the desert botanical garden through which we trailed.

Of all the tree products of the desert, the Pal'o-Ver'-de is one of the most beautiful and interesting. Its name is Spanish, and means "green tree."* According to its soil and water supply, it may be as large as an adult apple-tree—fifteen feet high, with a trunk nine inches in diameter—or as small as a mountain laurel bush three feet high. Almost as far as it can be seen, you recognize it at once as something different, and remarkable. Instead of a top that is made up of leaf masses, one laid upon another, you see that its foliage—or rather the masses where its foliage ought to be—is composed of *straight lines*, and angles! The Palo Verde bears a few tiny leaflets, so small

**Parkinsonia microphylla.*

that it would take about twelve of them to cover a postage stamp; but in November they exert no influence whatever upon the general aspect of the tree.

Regardless of leaves, however, from root to top the Palo Verde is of the most beautiful green that could be imagined. It is not the bold, waxy, aggressive green of the creosote bush, but the soft, smooth and delicate green of the asparagus.

The bark is as smooth as the surface of polished oak, and trunk, branch and twig are alike persistent green. Even the bark of the trunk has a surface like a robin's egg.

The terminal twigs are long, straight and slender, like masses of green darning needles set where the leaves ought to be. The density of their colour, added to their unique form, gives the tree as a whole a peculiarly lineated top. This is one of the very few desert trees that is free from thorns.

It is not often that I fall in love with a tree; but there are *no* other trees (of my acquaintance) like the odd yet beautiful Palo Verde. I never wearied of it. By its pronounced colour you can distinguish it from the darker mesquite and iron-wood, as far as you can recognize colours. As a tree for house and table decorations it has immense possibilities, and I am surprised that the florists of New York, and the givers of fabulous dinners, have not long since learned its value and brought it into use. Now, a Palo Verde tree—or, still better, half a dozen of them—six feet high, rising from a banquet table, would be something worth while, and also new.

This tree is not particularly useful. Its chief purpose is to ornament the arroyos and flood basins of the desert regions, and to furnish brake-blocks for desert freight-wagons. It strings along the arroyos, wherever the water supply is a little above the average, but on the open, level plains it is rare. Often from many a square mile it is quite absent. In density and grain, its wood is much like that of the white birch. The trunk consists of a single stem, upon which the branches are set in very abrupt and angular fashion, all of which merely adds to the odd appearance of the tree.

The Honey-Pod Mesquite* is the most persistent bush-tree of the deserts. Both in form and in habit it is much like the palo verde, and in southern Arizona and Mexico the two species are almost inseparable companions. On the desert plains, where water is scarce and dear, the mesquite is a modest little bush three feet high; but along the arroyos, the valleys, and in the business centres of the flood basins, where the water-wagon is more in evidence, it develops into a real tree. Often it grows to a height of twenty-five feet with a writhing trunk twelve or more inches in diameter. In growth habit it is very much like an apple-tree—a low, heavy, wide-spreading top with crooked branches that frequently are horizontal, on a short, stout trunk of irregular shape. The bark is gray and the foliage is of a pale gray-green tint—not so pleasing as the asparagus-green of the palo verde.

The leaves of the Mesquite are very small, and set on their stems in a fashion that by botanists is called twice-

**Prosopis velutina.*

pinnate. In this case it means that the leaflets are set in pairs—about twelve of them—along the deciduous stem. Individually the leaflets of the Mesquite are so tiny it would take about ten of them to cover a postage stamp. This tree is related to the honey locust, and its seeds are developed in a pod. Both foliage and "beans" are eaten by horses and cattle when grass is not obtainable and hunger is great. Its seeds are greedily eaten by all the small rodents of the deserts, and by many birds, also. Although its leaves are very small the shade of the Mesquite is very grateful and comforting.

The Mesquite is well provided with thorns, but fortunately for the proletariat, they point forward instead of back. Its wood is hard, fine-grained, durable and the general stand-by for fuel throughout the whole South-west. Blessed is the desert wayfarer who has dry Mesquite for his camp-fire; for without it, fire-making is a serious problem. It burns freely, makes a hot fire and quickly produces a good bed of coals for the baking of bread and the frying of meat.

In the simple house-building of the deserts, Mesquite constitutes well-nigh the only wood that is available. The stems are used to support the earth roofs of houses, to build into fences for corrals and cultivated fields, and to repair broken wagons. It is said that the Mexicans also use it in the making of furniture.

Throughout our trip we found the large Mesquite trees of the valleys and flood plains grievously afflicted with mistletoe. It usually appears as a great, dark-coloured bunch two feet in diameter, and sometimes we found half

From a photograph by D. T. MacDougal

The Deadly Mistletoe at Its Worst

The Murder of a Mesquite Tree

a dozen clumps in one tree. This parasite, like most others, is destructive when overdone. We saw many hapless trees that had literally been murdered by it, and were then only lifeless stubs. It was in the valley of the Sonoyta River, near Agua Dulce, that Dr. MacDougal photographed a wide-spreading Mesquite whose top was so overloaded with mistletoe that it looked as if a small load of clover hay had been pitched into it.

The Acacia or "Cat-Claw"* belongs to the deserts of Arabia and the high and dry plains of India, but a species of it, much resembling the scraggy *Acacia arabica* of the Ganges-Jumna plain, is frequently in evidence in the South-west. By its thorns shall ye know it; for they point backward, and small though they are, like the claws of a half-grown kitten, they can cut your epidermis right painfully. The Cat-Claw Acacia looks much like the mesquite; and its leaves, also, are pinnate and very small, on the general basis of about seventeen pairs to a stem. In the valleys with most water, particularly that of the Sonoyta, we found this tree associated with the mesquite. Many times the former was hurriedly mistaken for the latter, but only until its thorns had made an impression.

There is one other arboreal feature of the deserts which, because of its picturesque oddity, I have reserved to the last. It is a product of the plant world unique in character, and standing as much apart from related genera and species as does the prong-horned antelope among hoofed animals. It is the Ocatilla,† the Spanish name of which is pronounced O-ca-tee′-ya. Next to the

Acacia greggi. †*Fouquiera splendens.*

giant cactus, it was the most monumental and picturesque thing of plant growth found by us in two hundred miles of fertile deserts.

The Ocatilla is a multiform tree, and there is nothing else that is at all like it. Instead of having a tall main stem and many branches, large and small, it has an exceedingly short stem and many very long, wand-like branches. The leaves grow all along each branch, from bottom to tip. The stem is a big, thick mass of solid wood, *all underneath the earth* (where the earth has not been blown away), and the top of it is large enough to afford holding-ground for each branch. From the very limited upper surface of the main stem, starting usually at the level of the ground, there rise a score or more of long, slender rods of light wood, their bases firmly packed together, but otherwise free. They are like slender and very symmetrical fishing-rods. As they rise, they droop outward and spread apart, until they form a group shaped like a morning-glory vase. When it is in full leaf, the Ocatilla is like a bouquet of green wands held at the bottom by an invisible hand.

The stems vary in number from three to seventy-three, or even more. I can vouch for the last-named number by count. The largest Ocatilla that I particularly noted had some stems that were, by measurement, eighteen feet long.

One of the strangest features of this odd multiple-tree is its leaves and thorns. The leaves grow thickly all along the stem, each blade an inch and a half in length. The blade springs full-fledged from the upright woody

stem, with no free petiole, and its colour is dark pea-green. This profusion of leaves gives each stem of the Ocatilla a highly pleasing appearance, and denotes water in the not-far-distant yesterday. A large Ocatilla in full leaf is a beautiful object, and every line of its ensemble bespeaks development in a land of queer things.

But mark the transformation!

When the last rain has become only a distant memory, when the hungry roots have sucked the last drop of moisture from the sandy soil, the hour for a change has struck. Fleshy leaves an inch and a half long are far too luxuriant to last long in a desert. They dry up, and they drop off—all but the midrib, which takes form as a big, woody *thorn* an inch or more in length.* Then and thereafter each stem presents the most frightful array of thorns to be found on anything outside the cactus family. So far as cattle, burros and wild animals are concerned, an Ocatilla in a state of defence is practically impregnable. We saw only two stems that had been barked by food-seeking animals, and that work had been done by wild burros, at great trouble and expense.

Dr. MacDougal was at some pains to show me the precise manner in which the truculent Ocatilla thorn is developed from the harmless green leaf; and it was highly interesting. Just why the animals of the desert do not greedily devour the stems when in full leaf, and thornless, the present deponent does not know. It is there that Evolution must account for an exception.

* For an illustration of this transformation, see the Ocatilla pictured opposite page 80.

Except on the plains dedicated to the creosote bush and mesquite, the Ocatilla stayed with us from Tucson to the very foot of Pinacate Peak. It is the inseparable companion of the giant cactus, but unlike the latter, it grows larger along the international boundary than fifty miles farther north. On the night that three of us "laid out" on the slope of Pinacate, we found near our bivouac a large dead Ocatilla whose rods of clean white wood burned with a brilliant light—too bright to last. These naked rods are used by the Papago Indians in building fences, and screens around the verandas of their adobe houses.

The last state of the beautiful Ocatilla is as odd as the first. When Death has clutched it firmly, and it has yielded up its multitudinous life, the structure collapses upon its root, and the branches fall outward toward every point of the compass. As the whorl of white skeleton stems lies upon bare lava, or decomposed granite or sand, they look uncommonly like the arms of a dead octopus; and the trunk makes an excellent imitation of the creature's body and head. The thorn cases of the stem-arms very well represent the suckers—and what more will you have?

The Iron-Wood tree (*Olneya tesota*) is not of sufficient importance to justify prolonged attention. It looks very much like the mesquite, but its wood is as hard as its name implies, and so heavy that it will not float in water. The largest specimen I noted particularly was a conspicuous part of our aforesaid bivouac on Pinacate. A trunk fully a foot in diameter and twenty feet long was twisted

From a photograph by the Author

The Beautiful Ocatilla, or "Devil's Chair"

In the Ajo Valley, ten miles south of Montezuma's Head

almost into a figure-8 knot, but it was what cattlemen call a "lazy 8," for it lay upon the ground.

Last of the important bushes and trees of the desert—but often it is the first—is the Creosote Bush.* It is by far the most omnipresent representative of the plant world throughout the region we traversed. I think we saw hundreds of square miles of it, and most of all was on the trail from the Ajo mines up to Gila Bend.

The specimen shown with Mr. Sykes and the grave of the murdered Mexican is an excellent picture of a Creosote Bush which may be regarded as the type of ten million others. The Creosote Bush is a big cluster of small and brittle woody stems, covered with smooth brown bark. The stems do not branch until near their tops, and there they send off a few fine twigs to support the irregular clusters of tiny leaves that form the outer surface of the bush. The leaves are of a rich, bright green colour, and so shiny that they look as if recently varnished. They taste unpleasantly like creosote (oil of smoke), and no animal can eat them.

The leaves of the Creosote Bush are so wholly on its outer surface that it would be quite easy to shear them all off, as one shears a sheep, and leave the bush nearly full size but perfectly bare. The usual height of this bush is from two to three feet. The clumps stand about ten feet apart, and usually there are from 100 to 150 per acre. In a few localities we saw some very large specimens, which grew fully ten feet in height.

The purpose of the Creosote Bush surely is evident to

**Larrea Mexicana* or *Covillea tridentata.*

the dullest traveller. It is the great sand-holder and dust-storm preventer of the deserts. Its multitude of small stems, *growing well apart*, have been specially designed by Nature to catch drifting sand, or dust, and hold it! Without it, the deserts would be unbearably dusty whenever the wind blows. Along the western side of MacDougal Pass we found a wide plain of Creosote Bushes that was being invaded by the loose, dry, yellow sand blowing eastward from the "sandhills" of the Gulf of California.

At that time (1907) the original level of the desert was partially bare, but the drifting sand had been caught and held by those bushes until each clump was filled with sand one-third of the way to its top. They were slowly being buried; and some were already dead.

Elsewhere, we found a spot of sandy desert, where the opposite process was going on. The sand had been swept away from between the widely scattered bushes until each bush now stands upon a mound, bravely refusing to give up and die.

The cacti were a great botanical exhibit, and well worth the labour of the whole trip; but they were so wonderful and so varied that they require a chapter of their own.

CHAPTER VI

UNROLLING THE PANORAMA OF THE DESERT

Fine Weather, Hot and Cold—The Best Kind of a Wash—Two Ravens Pester our National Emblem—Coyote Mountain and Well—Hayes' Well and the "Well Ahead"—A Narrow Escape—A Papago-Indian Village—Tank Water and Well Water—Camp on the Santa Rosa Plain—Animal Life—The Passé South-western Indian—The Organ-Pipe Cactus.

Even with good trails to travel over, it is no child's play to take an expedition such as ours from Coyote Mountain to the International Boundary. There are chances a-many for the loss of time, trail and opportunity. The total absence of guide-boards from all trail-forks and crossings is admirably adapted to the mixing up of trails and travellers, and the precipitation of serious troubles.

With the sketch map of Pima County, which Dr. MacDougal had provided, we would have found our way; but Mexican Charlie's knowledge of prevailing conditions in wells and tanks, in addition to his information regarding the best and most direct trails, undoubtedly saved us a a great amount of wondering and worrying about things ahead. Not once did we go wrong, nor make a mistake regarding water.

The weather was simply glorious. The days were cloudless and hot—though in comparison with the *really* hot days of midsummer in Arizona, the midday temperature that we experienced should be regarded as bleak

and cold! What are 90° in November in comparison with 130° in August!

After sunset the heat of the day rapidly cools. By eight o'clock every sleeper covers his head, and long before midnight he fervently thanks his stars—on duty aloft to the number of a million or so—that he is under four good blankets.

Daylight finds the world stinging cold, with either frost and ice on your upper deck, or an icy-cold sop of dew, which is worse. Getting up in the cold gray dawn is a serious matter; but in a crowd of old campaigners no man likes to be "last" every time. A complete change from warm sleeping garments to the working clothes of the day is a shivery proceeding, but the wise ones know that it is best not to try to avoid it by sleeping in the garments of the day.

I think that the only radical reform wrought by my influence in the conduct of that band of hardened land pirates touched upon and appertained to the daily morning wash.

In nearly every cold-weather camp of real hunters, Iron Stoicism is the order of the day. The cook takes pride in making the food and the coffee good and hot, but it is just there that Luxury wanders off the trail and bogs down. It is the regular thing to arise on a whizzing cold morning, fill the wash-basin with ice and water from the pail, fish out the ice and then proceed to commit assault and battery on the helpless hands and face. After that, the breakfast food is put upon a steel plate that is like a sheet of ice, and can be warranted to cool off the warmest food in two minutes.

Now, I have found that as a fixative for real estate on the paws of a camper, there is nothing that surpasses ice-cold water, hastily and grudgingly applied. Those who love ice-water for bathing purposes are welcome to the enjoyment of it; but for me, stoicism breaks down at the bath-tub and the morning wash-basin. In cold weather I fling Appearances to the wintry winds, and spend fully three minutes in warming wash-water over the camp-fire. The result is Luxury; and with it the day begins Right.

One after another, my companions all succumbed. Timidly at first, Mr. Phillips held the wash-basin—which was a miner's gold-pan—over the camp-fire; then came the Doctor, and finally Mr. Sykes; and they extracted solid comfort from the cheap and easy luxury that usually is sacrificed on the altar of Pride.

North of Roble's Well-in-the-desert rose a long and imposing chain of mountains, composed of Roskruge's Range, Sam Hughes' Buttes and the Abbie Waterman Mountains. Beyond Abbie's real estate holdings were the Silver Bell Mountains, the Silver Bell mines and smelter, and much real mining activity.

When eight miles from Roble's we were half-way through Coyote Pass, and abreast of Coyote Mountain, a fine range that loomed up on the south, quite near at hand. We were then just entering the Santa Rosa "Valley"—by caprice so called—a great plain forty miles wide, with numerous mountain pyramids scattered over it. To cross it is nearly two days' work.

It was opposite Coyote Mountain that we noticed,

a quarter of a mile ahead of the outfit, two ravens* audaciously harrying an eagle in mid-air. They would turn on the electric current, dash after him on swiftest wing, and, with beak or wings, try to strike him from above. Slowly and ponderously he flapped toward the north, and each time that he was beset by the truculent ravens he plainly showed annoyance. Eight or ten times the ravens raced after the bird of freedom, and palpably got on his nerves. And each time he gave a perceptible gesture of impatience; but otherwise he steadily pursued his northward flight. At last the ravens abandoned the chase and flew back whence they came.

Being challenged to interpret the meaning of the mid-air conflict, I advanced the theory that the lordly eagle had been meddling with something which the impudent ravens claimed as their property; and I even went so far as to predict that we would find dead meat about 1,320 feet ahead. Sure enough, we presently passed the remains of a horse, on which ten ravens were holding a solemn inquest. It appeared that the eagle had attempted to conduct the obsequies, and two fighting ravens had been appointed a committee to drive him away. It was interesting, but we disliked to see our national emblem pestered by ravens. Evidently he felt that ravens were not in his class.

At noon we halted at Coyote Well, and a very good well we found it. It had been dug ten feet through

*The White-Necked Raven—*Corvus cryptoleucus*. In size it is about midway between the northern raven and common crow. The feathers of its neck are white *at the base only*, and to all outward appearances the bird is all black. Its voice is not so hoarse as that of the northern raven.

gravelly earth and loose rock, and walled within as a square pen of poles. Below that, it went down through fifty feet of solid granite rock, and needed no wall. The top was very satisfactorily enclosed by a curb of boards to keep out rabbits and snakes—a most necessary addition to any well, in any country.

Along the arroyo of the well the mesquite trees were large and heavily laden with sinister-looking clumps of mistletoe.

At three o'clock we reached Hayes's Well, twenty miles from Roble's; and then an interesting question arose. It was this: Shall we go on eight miles farther, to the next well, arrive there after dark, and make twenty-seven miles for the day, or shall we camp where we are? For once, Charlie Foster did not know anything about the character of the well ahead.

Without knowing precisely why, Dr. MacDougal decided that we would not take chances on reaching the next well that day, but would camp where we were. So at Hayes's Well we camped, in a tract of desert jungle of mesquite and palo verde that much resembled a peach orchard. There were very few cacti, but the grass was good.

The next day, about eleven o'clock, we reached "the well ahead"; and when we looked into it, we shuddered and said, "Ugh! Good gracious!"

It had no curb. Its mouth was at the ground level, and wide open. Twenty feet down, on the surface of a wide expanse of black water, there floated *a dead rattlesnake*, swollen to the size of a man's arm, half decomposed and ghastly white.

Had we pulled up to that well an hour after sunset, in pitchy darkness, with horses and men tired, heated and thirsty, we would have sent our canvas pail down into that horrid hole and tried hard to make use of its awful water! Possibly we would have detected the presence of some dead thing that was much worse than usual, and gone without water until *noon the next day;* but that possibility is open to doubt. Some one might have said, as usual in such cases,

"Oh, it's nothing but a dead rabbit!" And we might, under stress of the occasion, have used that water for man and beast. We were right thankful that the Doctor's instinct-of-the-desert impelled him to order a halt at Hayes's Well, and saved us from that rattlesnake.

In Arizona and California there should be state laws by means of which any county failing to maintain a snake-proof and rabbit-proof curb around each of its desert wells might be fined heavily.

On this day we passed through a real forest of giant cacti, where those desert wonders grew thickly and large. About eleven o'clock, and three miles from the Comobabi Gap, we entered the domain of the barrel cactus, or bisnaga, though I do not mean to say that none had been observed previously. It was there, however, that we found them growing very large, and numerously. It was there, also, that Dr. MacDougal operated upon a fine, big specimen, and showed us how to obtain from it a supply of good drinking water; all of which will appear later on.

We also passed through a tract that was especially

devoted to the ocatilla, for there they were so numerous it was like an ocatilla nursery. Such manifestations were rather common, even unto MacDougal Pass; and the ensemble of so queer a forest is delightfully odd and interesting. Many of the specimens we saw that day were fifteen feet high.

As if to have their turn, there was also a special forest of extra large mesquite and palo verde trees; and such tracts always resemble an orchard of apple-trees and peach-trees, mixed together, half-way into full leaf.

The midday hours of our third day out found us in the narrow gap that passes the trail through the Comobabi Mountains, fifty miles from Tucson. There, also, we came to the Papago Indian village of Comobabi, or rather two villages, occupying two commanding ridges that come down from the southerly mountains with a ravine between them. The trail led us into the heart of the westernmost town, and there we found about thirty very decent houses, and a hand-made "tank" of dark-brown water full of wigglers.

The habitants were all away, not even so much as a dog remaining. Charlie Foster explained that they were gone to their "temporal" quarters, near their fields of ripening corn, and the men were busily engaged in harvesting and getting drunk. It seems that the annual corn-shucking bee is always taken as an excuse for a great orgie, in which every man—and possibly an occasional woman, also—gets fighting drunk on whiskey made from unripe corn, fermented literally "while you wait." This corn-juice episode continues for about a week, during which

period the Papago patient is regarded as "bad medicine," and is carefully avoided by every weather-wise paleface.

The absence of the Indians gave us an excellent opportunity to examine their domiciles. Now, it happens that the Papago Indians—whose name is Spanish, signifying "Bean-Eater"—are averse to being photographed, for reasons quite sufficient for home use. They think that a photograph of a man takes from him a part of his spirit, and exercises over him an undesirable influence. Therefore do they resist the making of photographs of themselves. Had the Bean-Eaters been at home, we certainly would not have been quietly suffered to work our will on their ancestral halls as we did that day.

Dr. MacDougal said, "It is entirely possible that a settlement of Papago Indians has existed on this spot, or at least very near it, for the last five hundred years!"

I was greatly surprised by the thorough cleanliness of the village, and the absence of malodorous refuse. Assuredly those Indians know something of the virtues of sanitation; and they are not slothful in the business of keeping their villages clean. The expected garbage heaps, and their attendant swarms of flies, were absent; and the absence of newspapers blowing about the streets made my eastern home seem very far away. True, there was a small quantity of cast-off civilized things behind one of the houses, but it was composed of inorganic matter and offered no field for the village board of health.

Externally, the houses are very well shown by Dr. MacDougal's photograph. The main building of each establishment was always either of adobe (sun-dried

bricks of local mud) or rough stone neatly laid up in courses. In front of each house was a veranda consisting of a roof of poles covered with earth, or leaves, or something that would yield shade. Within, the houses contained very little, except strong presumptive evidence of contact with modern civilization—the craziest crazy-quilt on earth. We saw such things as worn-out feminine shoes with high French heels; corsets out of commission; tin cans, and broken kerosene lamps. I looked in vain for the remains of bicycles and automobiles; but assuredly they will come in time.

Two or three doors were locked, with padlocks; but so far as we could see, there was nothing within that even a tramp would covet or purloin. Along the side of one house was a shaded veranda, and in front of it was a close screen of dry ocatilla stems. Out in the open, in the centre of a group of houses, was a bake-oven, shaped like a miniature coke-oven, with a door in one side.

There was one house that was of paramount interest, at least for that quiet spot. It seemed to be a town hall, and was large enough to hold a council of at least twenty Indians. It was locked with a padlock. In front of it was the Public Square—a twenty-foot area of bare earth, shaded by a flat roof of poles, supporting branches that once were green. In the refreshing shade of this public lounging-place there were two municipal benches, one of which boasted a back.

The red water in the cattle's pool was relished by our thirsty horses, but the other members of the party balked at it. Charlie Foster was loaded with six empty canteens

and sent off into the Unknown, where he said he knew of a well of good water. Even with the mercury only 95° in the shade, good water in a sun-baked desert is a highly prized luxury; and the white man who goes more than thirty-six hours without water usually goes down to stay.

Strange to say, the village tank was situated, not deep down in the nearest arroyo, but up on the ridge! How it ever fills with rain-water is a mystery, and we leave it with the noble Bean-Eaters of Comobabi.

We watered our horses in the reeking tank, fed them and gladly sat ourselves down in the scanty shade of the wagon, to rest and eat a frugal luncheon. A watermelon that had been saved from the raid on the Papago wagon was here broached, and quickly consumed; but it was Charlie's arrival with six canteens full of good water that really saved our lives.

On the desert it is drink, drink, drink! from two hours after sunrise until one hour before sunset. Each man carries his personal canteen, and it is a duty that he owes his party to keep it with him, and fill it on every fair occasion. Unless you have travelled the arid regions, doubtless you have no idea how *good* water really is. I do not mean apollinaris, or vichy, or white rock, or any other "table water" of the Pampered Few, but just plain, old-fashioned H^2O, of well, or "water-hole," or desert "tank," as the case may be. Dr. MacDougal says that in the maximum heat of midsummer in the Southwest an average able-bodied man consumes *two gallons* or more of drinking water daily.

After the halt at the Comobabi Indian village, we

From a photograph by D. T. MacDougal

Papago Indian Houses and Oven, at Comobabi

From a photograph by J. M. Phillips

Adobe House at Wall's Well

trekked on westward, into a total of twenty-eight miles for the day. About mid-afternoon Dr. MacDougal's keen botanical eye caught sight of a very large giant cactus with a flourishing and audacious bunch of prickly pear (*Opuntia*) growing upon the tip-top of the main stem. In the presence of so novel a development, the like of which never had been seen before, there was but one thing to do. The doctor's "big camera" was hauled out, unlimbered and wheeled into action, and a fine photograph was the result.

At sunset we halted our tired horses at another Indian-made tank, in a very red desert. We were then at the geographical centre of the great Santa Rosa Valley, at the crossing of the north-and-south trail to Casa Grande, and the Camp was No. 3. During the day we had descended 1,000 feet, and the elevation was 2,180 feet.

The level plain stretched away northward and southward for miles that seemed endless; and the prospect was almost wholly creosote bushes. Near by were two Indian houses, adobe style, but at that time both were tenantless. We camped on the bare red plain, close beside a high embankment of red earth, on the farther side of which lay the half acre of red "tank" water. To create that water supply, some one had expended no small amount of hard labour, and we duly appreciated the effort. While we were outspanning, two Papago Indian youths rode up on burros to the top of the embankment, halted, and for fifteen minutes sat there like statues, intently regarding us, but neither moving nor speaking. When they began to

grow a trifle monotonous, they rode away, as silently as they came.

Just at sunset, when our little lonesome world was settling down for the night, some one excitedly announced a discovery.

"There are two *ducks* in the tank!"

Some one else quickly caught up a loaded shot-gun, and hurried along the side of the embankment to the upper end of the water. Secretly, I hoped that those ducks would take alarm, and fly away in time. To shoot those lonesome little birds that had flown on weary wing over a good hundred miles of waterless desert, clear down from the Gila River, seemed to me like a sin against Nature. On a great occasion I can kill a head of game, but to me those two individual ducks seemed entitled to our hospitality and protection.

And the goddess Vishnu elected to preserve them. When we heard the report of the gun, our spirits sank; but when the hunter quickly returned with the terse announcement, "I missed them!" some one said,

"I'm glad of it!" And to our surprise he answered, "So am I!"

The ducks remind me of the things killed during the day by Mr. Phillips for the frying-pan. We had thirteen Gambel quail, two cotton-tail rabbits (weight of largest, one and one-half pounds) and one Arizona jack rabbit (skeletonized; weight four and one-half pounds). Six of the quails weighed exactly two and one-half pounds. During the day we saw about one hundred and fifty quail, twenty jack rabbits, twelve cotton-tail rabbits, one coyote,

two Harris's antelope squirrels (*Ammospermophilus harrisi*), four badger holes, one western red-tailed hawk (on a giant cactus), one eagle and eighteen ravens.

Early in the forenoon of November 5th, our fourth day from Tucson, we came to another north-and-south range of gray-granite mountains. The main range is called the Quijotoa Mountains, and, fortunately for travellers, an excellent gap has been left midway through it for the passage of the trail. Westward of the Key-ho-to'as—as it is pronounced—a short range, called the Sierra Blanca, rises close beside the trail, and runs off northwestwardly for about ten miles.

Within the gap we passed several Papago villages, of eight or ten houses each, and about forty of the inhabitants were at home. The trail led quite near one village; and men, women and children arose from their arduous occupations of sitting vicariously in the shade, and gathered near the trail to inspect us.

They all wore the unattractive raiment of cheap civilization; and to me, Anglo-Saxon clothes on a savage invariably look out of place. If an Indian is not picturesque, why is he? During the past twenty years we have had so much thrust upon us about our south-western Indians, the whole lot begins to grow *passé*. At present, the only apparent use of the south-western Indian is to furnish trips to good fellows who need outings. Ethnologically, he is a squeezed lemon, and so far as some of us are concerned, he is welcome to enjoy a good, long rest.

The trail passes quite near a small graveyard, which

contains about twenty graves, each one marked by a white wooden cross. With a friendly salutation we passed the Indians, and I think no one felt the slightest desire to photograph any of them.

In that pass were three wells, and the best one was a mile westward of the last village, at the foot of a long ridge, curbed and covered. Near it we outspanned and spent the noon hour. While our horses ate, the members of the party who were not photographers filled all the water cans at the well; for the next camp was to be a "dry" one.

Ever since leaving Tucson, Doctor MacDougal had at intervals whetted the edge of our curiosity regarding the organ-pipe cactus. He was keen to know the extreme northern limit of that remarkable species, and whenever we came near mountains, he sharply watched for it. He said it was a large cactus, with many upright stems growing in a cluster, and rising like the pipes of a church organ. He even offered a reward to whomsoever might be the first to sight the plant; and what do you think the reward was to be?

"—A drink of cane-and-maple syrup, fresh from the can!"

The organ-pipe cactus* was seen for the first time growing on the foothills of the Sierra Blanca. Its latitude there is the same as that of Tucson. Later on we found its northern limit in the Ajo Valley at the Ajo Mines, forty miles south of Gila Bend. The species stayed with us until we reached the eastern edge of the Pinacate lava

*Cereus thurberi.

From a photograph by J. M. Phillips

Mr. Sykes Reflects Gloomily over the Grave of a Murdered Mexican, beside a Creosote Bush

From a photograph by J. M. Phillips

Organ-Pipe Cactus and young Giant Cactus

field, on the Sonoyta River, where I made one of the best of my pictures.

And truly, this plant is a very striking and interesting development. My prize specimen was twenty feet high, and contained twenty-two stems—as will appear later on. It was the tallest specimen that we saw in one hundred and forty miles of this species.

CHAPTER VII

FROM THE QUIJOTOA PASS TO THE MEXICAN OASIS

The Cubo Valley—A Typical Flood Basin—The Prize Giant Cactus—A Beautiful Camp at Wall's Well—The Ajo Lily—Montezuma's Head—Down the Ajo Valley—A Lava Ridge—The Grave of a Murdered Mexican—Across the Boundary and into Mexico.

On leaving the Covered Well in the Quijotoa Pass we entered the eastern edge of a desert plain called the Cubo Valley. It is thirty miles wide, from east to west, and at least fifty miles long. It is strictly a flood basin, for no stream worthy of a name flows out of it. The waters that run into the plain from the surrounding mountains are absorbed locally, and the few shallow arroyos that do exist, lead nowhere. As happens on many a flood basin and plain, there are places where the vegetation secures an unusual amount of water, and develops accordingly. It was a common occurrence for us to pass through a tract of tall and rank mesquite, palo verde and creosote bushes. Four-fifths of the Cubo Valley is covered with creosote bushes, the other fifth being mesquite. The giant cactus was absent, but the choya persisted, and at intervals held its place.

The centre and western half of the Cubo Valley is an excellent example of the flood basin—a very important feature in the composition of the Arizona deserts. The

From a photograph by D. T. MacDougal

Palo Verde and Mesquite Trees in a Flood Basin

storm waters which flow into it from its boundary mountains and spread out, have stimulated the growth of creosote, mesquite and palo verde until they have grown to double their average height on rolling plains. For miles on end, we pulled, and also tramped on foot, through country that was like a vast orchard of peach-trees, much taller than a man.

It was in such a spot that we finally halted for the night, and made a dry camp in the middle of the plain. Our travel for the day was twenty-one miles. We were ninety-five miles from Tucson, and the elevation was about 2,000 feet above sea level.

The wild-animal record for the day embraced a forty-eight-inch Texas diamond-back rattlesnake (*Crotalus atrox*), a desert horned owl, killed by Mexican Charlie, and about two hundred Gambel quail—seen, but not killed.

During the night a heavy dew fell upon us, rendering the outer blanket of my sleeping-bag quite wet; and the night was also very cold. At sunrise the temperature was 42° F. While the camp was being deconsecrated and repacked in the wagons, I skinned the horned owl, and finished the task on time—much as I disliked the diversion at that hour. Each of our horses had consumed five gallons of water from the cans, and five gallons more supplied the wants of the seven humans.

The road westward of our dry camp was rather bad, because the ground was soft, and the old trail had been so badly washed out by storm-water we were obliged to abandon it, and strike out a new track alongside, through

the bushes. Fortunately the barren spaces between the trees were sufficiently wide and constant that no chopping was necessary. Because of the heavy labour for the teams, the four passengers walked during the whole of the forenoon.

It was during this walk ahead of the wagons, and not far from the Ajo Mountains, that the giant cactus* joined us once more. And presently an exciting incident occurred. I found beside the trail a giant cactus of truly gigantic proportions, and supplied with nine huge branches. My collector's instinct at once told me that that saguaro was, in all probability, the finest specimen in all Arizona, and the very finest out of a million. Feeling perfectly certain that we would not see its equal, I photographed it to the best of my ability, and to make absolutely sure of a good picture, Mr. Phillips also took it. Both results were satisfactory, and having Mr. Phillips alongside for comparison, my effort is reproduced herewith.

This giant was, by our best estimate, between fifty-five and sixty feet high, and its assemblage of massive arms, all symmetrically developed, made it look like a huge green candelabra with accordion plaits, and stickers all over its ridges.

Subsequent observations proved that the specimen described above really was the finest example of its kind that we saw on our entire trip; and it is a smug satisfaction to remember that we secured two good pictures of it when we had the chance. In the great south-western arboreal desert I have two items of personal property. That

* *Cereus giganteus.*

From a photograph by the author.

The Finest Giant Cactus

cactus is one, and the other is a certain grand-prize organ-pipe cactus between Agua Dulce and the Playa Salada, or Alkali Plain, on the Sonoyta River.

Early in the afternoon we reached the gap between the Gunsight Mountains on the north and the Ajo Mountains (please pronounce it Ah'ho) on the south, at a point five miles south of the Gunsight Mines. Wall's Well is situated in the gap, and inasmuch as there is not a drop of water between that well and Sonoyta, we were obliged to camp there in order to make the Sonoyta Oasis with only one dry camp between.

Wall's Well, or "Wall," as it once was called, is very much to our mind. It was three o'clock of a perfectly glorious Arizona afternoon when we surprised and delighted our horses by outspanning for the day, and turning them loose to graze. I think that even the most jaundiced man must feel symptoms of pleasure in seeing a tired and heated horse roll on a bed of clean sand, over and back, then get up and shake himself, and snort his thanks.

We parked our battery on a beautiful level stretch of clean sand, in the shade of some big mesquite trees, a cable's length beyond the well. Quickly we took advantage of the opportunity to air our sleeping-bags and overhaul our war-sacks.

At three o'clock the day was mildly hot—and just right for a jolly bath. While my companions presently scattered to work out various designs—the Doctor and Mr. Phillips to hunt deer, and Mr. Sykes to climb a mountain for observations—I repaired to the neighbourhood of the well.

With our largest canvas pail full of water, and a basin, I took a pouring-bath, after the manner of India, and acquired merit. It strikes me as singular that outside of India, and the haunts of those who have been there, sportsmen and travellers generally do not seem to know how easily and cheaply one may obtain, with two pails of water and a great cup to dip with, a fine and enjoyable bath. The average American sportsman thinks of but two possibilities—a nerve-racking plunge in a cold stream, or an inadequate rub with a sponge; but a Wise One, when water is scarce, can obtain excellent results from even a single pailful of water. The whole secret lies in the serving of the different courses from soap to rinse, and in skilful pouring on the back of the patient's neck.

Wall's Well is the most beautiful and comfortable spot between Tucson and Sonoyta—s. f. a. k. For a circumference of five hundred feet around the well it is like a Belasco scene in a theatre. I regret that I can neither show it all in one picture nor spare space for the series of half-a-dozen that would be required to do it justice with the Reader. But let us stand for a moment on the gravelly knoll above the well, and look westward.

In the foreground is the Well itself, carefully penned in with posts and planks to keep out any wandering horse that otherwise might become involved. There is a trough, a rope and a pail; and the water is fairly good. Immediately beyond the well the stage is clear, and covered with clean, smooth sand. Beyond that rises a green ruching of mesquite, palo verde and desert willow trees, that border a large but very dry sandy arroyo. Beyond that is the

foot of a terminal ridge that comes down from the Ajo Mountains; and on beyond that looms up a remarkable peak that is called Montezuma's Head.

Now, according to the best map of Pima County, that peak should be four miles south-eastward of the Well; but there you find it, full and fair in the eye of the sinking sun, a head-and-shoulders of bald, red rock, and you can take it or leave it. But, even though out of place, it is a remarkable peak, and has several different faces, according to the point of view. From a certain point in the northwest, as we found next day, it resembles a bust of George Washington in profile. From the well its top resembles the neck of a Hollandaise gin-bottle with a high cork *in situ*—or an unveiled statue in its swaddling clothes. At all events, the cork-like summit looks absolutely unscalable, and I think it is so; for all of its faces seem either perpendicular, or worse. Naturally, this peak is a conspicuous landmark for desert travellers, but particularly for those in the Ajo Valley. From the eastern points of the compass it is mostly hidden by intervening mountains. It seemed to be about two miles westward from the Well.

Wall's Well once was the seat of a serious mining industry, but now it is owned by the rabbits and ravens. Within a long stone-throw of our camp-fire there stood a huge pair of boilers nearly large enough to run a man-of-war.

Although now numbered with the has-beens, they are not badly rusted. Surely the hauling of those iron monsters from the railway, sixty-five miles across the desert, was a formidable undertaking; and all for naught. To-

day they are not even of value as scrap-iron. As they stood there in the open, level and plumb on a base of solid masonry, rising far higher than a man's head and staring dumbly into the desert out of their two big fire-door eyes, they seemed almost like living things, waiting for the rescue that never comes. I have heard a rumour that once those

The ghost of a dead industry, at Wall's Well.

boilers pumped water through a two-inch pipe to the Gunsight Mines, five miles away; but it needs confirmation.

Near the boilers stood the crumbling ruins of what once was a fine adobe building, undoubtedly the headquarters of the mining company that once operated here. There is no masonry building, save only a Buddensiek building in New York, that crumbles down so quickly as

From a photograph by the Author

Wall's Well and Montezuma's Head

one built with adobe walls and covered with earth. First, and very promptly, too, the roof collapses and falls to the floor, and after that the walls soon follow. At the finish, only a tiny mound of fine earth remains; and that affords excellent soil for the beans of the mesquite.

On the knoll above the ruins stood a very good Mexican adobe house, with a rustic veranda of mesquite posts and the usual roof of loose material. Fortunately, it was unoccupied, and Mr. Phillips and I exploited it without hindrance.

It was at Wall's Well that Dr. MacDougal found and pointed out for the first time two very interesting plants. One was the Ajo Lily,* from which the next valley, and the very extensive mountain range beyond it, derived their names. It was not then in bloom, and all we saw of it was three very long and very slender, dark-green leaves lying upon the sand, radiating. The leaves were about twelve inches long by half-an-inch in width. On digging for its root, we found a long string of soft, white fibre going down about eighteen inches below the surface to a tiny white bulb, like an onion-set.

When chewed it was mucilaginous, and had a perceptible onion flavour. Mr. Sykes tried it out, and said that its flavour was "beastly."

The Ajo—which for convenience we may call the Ajo *Lily*, was found from Wall's Well to the Pinacate lava region, where it had to halt.

The other interesting plant brought in by The Botanist was the tannin plant or canaigre (*Rumex hymenosepalus*),

**Hesperocallus undulatus.*

whose thick, beet-like root contains more tannin than anything this side of oak bark. To the human taste, the astringency of it is very powerful, but, unfortunately, the root cannot be grown in sufficient quantities to constitute an important factor in the leather industry.

The hunters for deer killed naught, but I saved the day's record by skeletonizing a black-tailed jack-rabbit for the Carnegie Museum. Frank Coles and his best man, Jesse Jenkins, filled all the water cans at the well; and with a rattling good supper of roast quail, surpassing hot biscuits from the Dutch ovens, other good things of sorts and a most perfect camp-fire, we ended a never-to-be-forgotten day.

On leaving Wall's Well, we described a quarter of a circle around Montezuma's Head—quite as if there had been a three-mile rope attaching us to the mountain—entered the Ajo Valley, and headed due south for Sonoyta. That last feature seemed like getting toward our goal; and for that leg of our journey, the country altered very noticeably. This "valley" is really a valley, with what stage managers would call "practicable mountains" near at hand on both sides, walling it in. The ground is hilly and hard, and stony; and the arroyos are many, and sometimes serious. The ocatilla takes its place in the landscape as a prominent and permanent feature, especially on the bare and stony slopes that came down from the Ajo Mountains. The organ-pipe cactus was seen at intervals all day on the lower slopes of the Ajo range.

At noon we halted in a very picturesque spot in the gently rolling plain, to permit our faithful horses to graze

for an hour in a meadow that simply could not be ignored. Quite near at hand were several very interesting things.

The ocatillas were the finest that we had found, and despite a brisk breeze, in which the tall, green stems waved gracefully but far too much, I set my shutter at one-two-hundredth of a second and took them successfully. Later on in the trip, another ocatilla that I tried to photograph with every condition in my favour was a total failure; and again was demonstrated the correctness of the golden rule in collecting: *Take the first good specimen you find, for fear you never find another!*

Within a stone's throw of our wagons, we found a splendid nest of a white-throated pack rat,* and on finding that Mr. Phillips was hopelessly busy in photographing a live Gambel quail, and likely to remain so, I set up my camera and essayed to take it myself. In view of the greatness of my need for a good picture, and of my soulful effort to do everything right, the picture that resulted is one of the wonders of the trip. It was an unqualified success—"*nee*-dle sharp!"—as Mr. E. F. Keller says of negatives that are extra fine. But after all, I did make one great mistake. It was in *not* photographing Mr. Phillips and Frank Coles as Coles herded the quail, and the Game Commissioner held his camera far in front of himself, stooped low and straddled far, with that hungry look on his face, as he followed up the doomed quail. Mr. Sykes saw the spectacle, and fired his camera at it, but the result was not a success.

**Neotoma albigula.*

As usual in such cases, Mr. Phillips was successful, as will be seen herewith.

The afternoon was cool, and the horses trotted along rapidly. Westward of us rose the Growler Mountains, but we came to a range standing east and west across our course that was totally absent from the maps. Beyond that we soon reached the top of a water-shed, from which the arroyos all ran southward, toward the Sonoyta River.

At night we made a dry camp on the bank of a charming arroyo that was well set in grass for our horses, just ten miles from the International Boundary and twelve from Sonoyta. Less than a mile away to the westward ran a miniature mountain range four miles long and six hundred feet high, all quite absent from the map until Mr. Sykes put it on. Having an hour at our disposal before the setting of the sun and the rising of the Dutch oven, The Four armed themselves and scattered. I chose the western ridge, and hoped to find deer about it, somewhere.

That ridge proved to be all lava! It was a mass of dark brown material, in chunks varying from small pebbles up to the size of piano-boxes, and all of it indescribably rough. Like most lava its surfaces were deeply pitted, and the finer grades were decomposing into dark-coloured earth, capable of sustaining plant life. This was the first evidence of volcanic activity that we had observed, and it represented an isolated straggler cone, quite surrounded by granite formations, and about forty miles from the edge of the great bed that we discovered later on.

From a photograph by J. M. Phillips

Gambel's Quail and Ocatilla, with leaves and thorns

From a photograph by the Author

Nest of Pack-Rat, in the Ajo Valley

At supper that night, November 7th, and six days from Tucson, the last of our quarter of fresh beef was consumed. I mention this because some of us regarded its longevity in that warm-day weather as a little remarkable. It was the dryness of the atmosphere, and the coldness of the nights, that preserved it so long. Our cooks took pains to expose the beef each night in such a manner that the nightly cold would reach it, while the nightly coyote could not.

It is quite near this camp that the trail passes the grave of a Mexican mail-carrier who was murdered by Apaches. The Indians hid in an arroyo among the mesquites and palo verde, and without giving the Unfortunate the slightest chance for his life, shot him to death. By his own people he was buried where he fell, beside a large creosote bush, and upon his grave a score of stones were laid out in the shape of a cross. While Mr. Sykes stood near the grave, gloomily reflecting on the sad fate of its occupant, and the uncertainties of Life in the Far South-west, Mr. Phillips properly recorded the episode with his camera.

The next day, November 8th, was a great one; for on it we crossed the boundary.

We were astir unusually early, and by half-past seven were rattling southward on an easy down grade. Plant life and tree life became secondary considerations, and all eyes were focused ahead. Straight across the end of the green Ajo Valley, and quite far away, a lofty range of mountains with two peaks atop rose into the blue ether, higher than any of the mountains elsewhere along the trail. In front of them were high, round-topped foot-

hills; and were they "this side of the Sonoyta River, or the other?"

Clearly, the high range was beyond the tiny river that makes the oasis. As the trotting teams ate up the intervening miles, the Sonoyta plain and valley began to focus more sharply on the screen. Presently we were assured that the river was "this side" of the small hills; but in the green plain the course of the Sonoyta River was not discernible; nor was there the slightest sign of civilization.

About ten o'clock some one shouted,

"Yonder's the boundary! See, there is a monument!"

On the crest of a lofty hill of rock, away to our right, was a snow-white pyramid of solid masonry, which we knew must be "169." It seemed a long way, however, down to the cast-iron-post monument, No. 167, which stands low down on the plain, two hundred yards from the trail. By the two, however, you are made aware that the direction of the boundary, all the way from Nogales to the Colorado River, is about N 60° W.

From the boundary, the Sonoyta Valley looks quite like the arboreal desert, generally, except that the green ruffles winding through it at its lowest level marks the course of the river. The highest peak of the lofty mountain opposite is 4,300 feet high. I know because Mr. Sykes climbed it with an aneroid.

Now, here is a very absurd fact; but no patriotic Mexican ever will believe it, even though he should see it himself. *The moment we crossed the boundary into Mexico, we struck two miles of the most barren and uninteresting desert that we saw on our whole trip!* The ground was

From a photograph by D. T. MacDougal

The Sonoyta River, Where Desert Meets Oasis

Mesquite and Willow; Organ-pipe and Giant Cactus, the latter very small

strongly alkaline, in places quite dead and bare, and I noted the change with mingled surprise and amusement. But right there I met an old and esteemed friend from Montana, named *Artemisia tomentosa*. It was the narrow-leaved mugwort, a species of very aromatic sage-brush, containing very little woody fibre. I met it in the Bad-Lands of Hell Creek, in the barren "blow-outs," where the mule-deer were feeding upon it most greedily, to the complete exclusion of the finest range grasses I ever saw.

In the upper Sonoyta valley this plant abounds, and the clumps grow so rankly that sometimes they reach a height of four feet. But it seems that nothing feeds upon it.

At last a sharp westward curve in the trail led us along the southern foot of a high ridge of decomposing granite, through creosote bushes, organ-pipes and giant cacti that are here very small and limbless. On our left we saw a little stream, like a tiny creek, with the desert coming down to its northern margin. But the small stream had said to the desert,

"Stop, thou—here! Thus far, but no farther!"

And twenty feet away, on the southern bank, the oasis began and ran riot. The other side was a perfect jungle of desert willows and other small trees, in which a man might lose himself, for at least five minutes.

All of a sudden the trail wheeled abruptly to the left; our teams dashed down a steep slope, splashed through a stream—a *running stream* of clear, pure water, and on the other side was Sonoyta.

CHAPTER VIII

THE SONOYTA OASIS

An Isolated Community—Sketch of Sonoyta—Judge Traino Quiroz and His Family—The Sorrows of an Amateur Photographer—Life in Sonoyta—Fruits—Absence of Grafters—Our Official Entrance into Mexico—Lieutenant Jesus Medina and the Fiscal Guard—An Annoying Slip of a Pen—Mr. Jeff Milton, Inspector of Immigration—A Man of Many "Gun" Episodes.

A HUNDRED times over, as I have looked on the maps at the queer Papago-Indian name "Sonoyta"—the *only* name printed on the long, bare stretch of 234 miles between Nogales and the Colorado River—I have wondered about that lonesome little spot. So far as I have read, no one ever has taken the trouble to write more than ten lines regarding the ensemble of the place and its people, and everything was left to the imagination. In my mind's eye, Horatio, it finally took shape as a hamlet of swashbucklers and ex-criminals of two nations, a tough American with a saloon and gambling-place, an adobe church with a cross atop, a priest, a Mexican custom-house and post-office, and a fringe of real "blanket" Indians.

By the morning of November 8th, I was almost consumed with curiosity; and then we found that *in not one particular* did Sonoyta resemble my imaginary picture of it! I was glad that it did not.

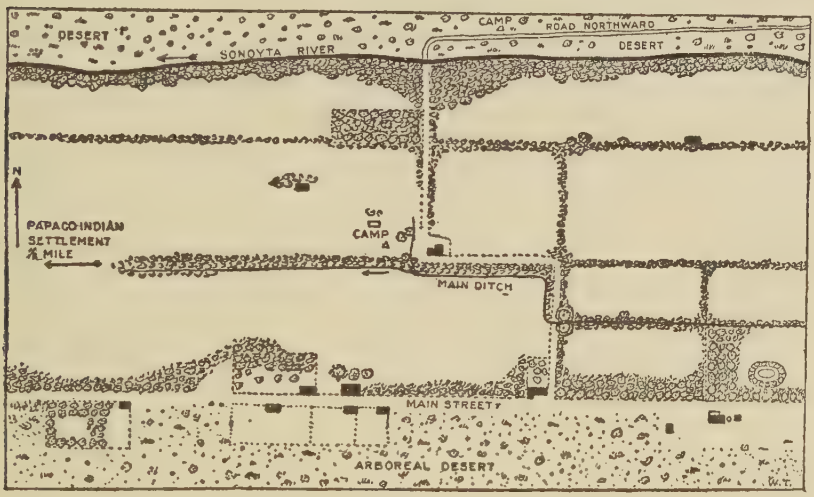
On overlooking the Sonoyta Oasis from the north—

From a photograph by D. T. MacDougal

View Across the Sonoyta Oasis, looking South-west

Taken from the hill opposite the river crossing

which for some curious reason no one ever has *called* an "oasis" until now—we saw a compromise between desert and running water. Near at hand, along the north, a fringe of compact, willowy jungle marks the course of the river. Beyond that lies a line of naked-November fields; then a long, hedge-like line of bushes starting in good form on the left, with a scattering of tall trees, and at the extreme



Sketch map of the Sonoyta Oasis in 1907.

right terminating in a lofty grove of dark-green foliage. Beyond that hedge-line there lies another procession of bare fields, another green string of hedge and more fields. As a border for the last series of fields there is a straggling growth of tall trees, and a string of adobe houses to the number of a dozen or so. Then comes the desert once more, planted full of creosote bushes ten feet apart; and in the distance a long line of mountains rises like a stage background.

So-noy'ta is a Papago-Indian word; and it means "The-Place-Where-Corn-Will-Grow."

Those three long green lines of hedge in the middle distance, that parallel the river, mark the courses of the three irrigating ditches of river water that give the Oasis its life. They are the arteries of Sonoyta. Burst the dam above them, and you break Sonoyta.

In November, the bare fields are the colour of the desert, and it is only the few tall trees stringing along the watercourses that make the settlement look unlike any other portion of the river valley, eastward or westward. Viewed from the ridge-side north of the river, the houses of the settlement are almost invisible.

Inasmuch as no one (s. f. a. k.) has taken the trouble to map this Sonoyta settlement, I have made so bold as to prepare a sketch map myself, made of notes gathered as I walked about on urgent business, and from our photographs. I made no measurements, and the scale was fixed by General Estimate.

We dashed across the brook-like Sonoyta River, pulled through the fringe of desert willows on its southern bank, splashed through a wide pool where ditch No. 1 crossed the trail, and entered a narrow and ragged green lane leading south. On our right there was a most inviting grove of fig and pomegranate trees, and white cottonwoods; but, strange to say, there was no house to match it.

At a turn in the lane, on the bank of ditch No. 2, we came to a two-family adobe house, with a stone mill in front of it. Four Mexican men in immaculately clean

From a photograph by J. M. Phillips

"Main Street" in Sonoyta, Looking East

The House of "the Singing Bird" on the left; Señor Medina's store and mescal establishment first on the right

shirts and trousers sat comfortably grouped on the mill, and the chief of the Sonoyta Papagoes sat on his heels. Under a veranda of the regulation type were two Mexican women, busily working. I asked Mr. Jeff Milton, who occupied one end of the house, the name of the family living in the other half; and with genuine embarrassment he answered,

"Well, I swear, I don't know! I never thought to ask!"

It was there that we parked our battery, and made our camp for two days; but we lost no time in viewing the town of our curiosity.

From the house of our friend Mr. Milton (U. S. Inspector of Immigration, Department of Commerce and Labor), the street runs eastward a short distance between two walls of tangled weeds, then abruptly bends back southward once more. We pass under a splendid white cottonwood tree (*Populus mexicanus*), its smooth bark as white as paper, cross the rushing stream of ditch No. 3 and quickly emerge on what we may as well call Main Street. This is the only street-like thoroughfare in the town, with houses on both sides and a metropolitan air. Eastward, there are only two houses; that of Judge Quiroz and one other. Westward lies the heart of the city. Here, at our right hand as we turn the angle, is the largest and most lonesome-looking house in the town. We never saw any life about it save the Lady in the Back Yard; and she seemed always busy.

Go westward, and you quickly come to a knoll, with at least six houses in view before you. On the right is

the square adobe box of a house in which lives the young Mexican woman whom the young men of Sonoyta call "the Singing Bird," because she warbles tunefully. On the left is the store and mescal establishment of Señor Jesus Molina, who was very civil to us, and kindly carried our mail-bag to the Ajo Mines, as we headed for Pinacate.

Señor Molina has seven children. At our request the whole family, with the Oldest Inhabitant—a venerable-looking man of 76, with a patriarchal beard—and several extra children, grouped themselves in front of the Molina door and in most friendly fashion stood for a picture. Opposite the Molina home was a picturesque habitation behind a fence of mesquite stems, all of which we took on a film for our own. The home of the Singing Bird is at the top of the knoll.

But the home and family of the Leading Citizen were at the other end of the street; and thither we went under the guidance of Mr. Milton.

Judge Traino Quiroz is a small man of 52, with a refined and intelligent face, a low, musical voice and the manners of a Castilian gentleman. His house, his mill, his forge, *and his little park* behind the fence across the way, constitute a very interesting establishment; and we were graciously permitted to inspect everything. Most interesting of all, after the Judge himself, is his family—fortunately an unbroken circle.

Señora Maria Jesus Quiroz is the mother of five fine children; and they are her jewels. Her home and her children show the tireless hand of the diligent wife and mother, whose work is never done. It is no child's play to

rear a family in a far-away spot like Sonoyta, where there is neither school, teacher, doctor, church, priest nor post-office!

We were at some pains to become acquainted with the children, and learn the name of each.

The oldest child of the family is a young man of about twenty, whose name is Arturo, which is Spanish for Arthur. Next to him is a fine young woman of eighteen, named Dolores, who is truly the belle of Sonoyta. The next in order is a bashful boy named Ysable; and I was vastly amused by the imperious manner in which his Sister Helena, next younger than himself, inspected him, *and condemned him*, when the family was about to stand for a photograph. She saw that his hair was awry, and said in a low voice (of course in Spanish),

"Your hair is not right for a picture. Go in and brush it!"

"Oh, go on!" said Ysable, with irritation. "It will do very well."

"It will *not* do! Go and fix it!"

"Oh, keep quiet. I will not!"

Then she flared up, fully equal to the occasion.

"You lazy boy! You shall *not* look like that! (Stamp! Jerk!) Go in, *this instant*, and brush your hair!"

"*Oh, botheration!*" said Ysable, with an expression of great annoyance; but he went! And the neatly combed hair with which he presently emerged was a decided improvement. Apparently the little mothers to big brothers are just the same in the Sonoyta Oasis as in New York.

The last of the flock was Angelita—Little Angel—

whom to see is to love. She was eight years old, I opine, and as dear a little Lady as one could wish to see. She wore a small corsage bouquet—from which I suspect that visitors were half expected on that afternoon, and her behaviour was perfect. The palefaces from the North did not frighten her in the least, and she posed for her picture as steady as a statue.

The photographing of the Quiroz family is a sore subject. I made what I hoped would be a good series of pictures of this fine Mexican family unit, and the effort cost its members no little trouble. Afterward, on another film, I took the mill, its burro motor and a Papago Indian on horseback who strayed by just then, and flinched not before the camera.

Alas! for the evanescence of human endeavour! By a most deplorable accident in my war-sack, the film of the Quiroz family was ruined, and I have nothing to show *or to send back* save a picture which Mr. Phillips made, very hurriedly, with the intention of returning another day for a more serious effort. Verily, the camera is a great thing to teach men to bear disappointments; and the man who can monkey with it a whole month without using language shall acquire merit.

The Margin of Life in Sonoyta is rather narrow. With a handicap so great, it could not well be otherwise. The place would afford a leisurely political student a most interesting study in social economy. It makes me think of a balanced aquarium—wherein the fishes, the water and the plant life are so nicely adjusted that, with a trifling food supply from without, the *status quo* goes on indefi-

From a photograph by the Author

Stone Mill and Forge of Judge Quiroz

The garlands hanging upon the forge-roof are flaming red peppers

From a photograph by J. M. Phillips

The Leading Citizen of Sonoyta, Judge Traino Quiroz, and His Family

nitely. Sonoyta is nearly, though not entirely, an automatic settlement. The nearest place at which anything can be purchased outside is the little store at the Ajo mines, fifty miles away; and after that, Gila Bend, ninety miles distant, with only one well-watered camping-place en route.

It is useless for the people of Sonoyta to raise much more of grain and fruit and vegetables than they consume, because there is no market available to them nearer than a long four days' haul across the desert; and even then they find only a tiny village, wanting very little. Therefore do they study to produce from the soil only the products which they themselves can consume between harvests, and the alfalfa which their own horses require.

I heard of one man of Enterprise who thought to meet a demand, and met only disappointment. Thinking that he detected a desire for an extra supply of onions, he raised a large crop, only to find that he had produced an unmarketable surplus, that could neither be sold nor consumed. George Saunders told me that he was keenly disappointed, and had registered a solemn vow that never again would he raise anything to meet the wants of anyone outside his own family.

Naturally, we were curious to see what fruits are grown in the Sonoyta Oasis. First of all I expected to find a fair showing of the citrous fruits—oranges and lemons; but they were, I think, quite absent. Just why they were not in evidence I failed to discover. Certainly there is no apparent reason why California oranges,

lemons, cherries and other fruits cannot be grown in Sonoyta, by irrigation.

Of fruit trees, only two kinds seemed to be in favour, or visible to the unaided eye. They were the fig and pomegranate. The former is well known, the latter not so well.

The pomegranate*, as grown in the gardens of Sonoyta, is a rather open-topped tree from fifteen to twenty feet in height, deciduous, with long, lance-shaped leaves. It is a native of Asia. The fruit is about the size of an apple of medium size, with six well-defined sections that are pinched together at the top. It is sub-acid, edible of course, and in Mexico an ardent spirit is made from it.

We saw fig and pomegranate trees growing in many places in Sonoyta, but best of all in the fenced garden of Judge Quiroz, opposite his dwelling. There, also, we were surprised at finding a miniature botanical garden, containing agaves of good size, and many interesting cacti. The slope of a tiny hill, mostly of rock, had been terraced, and the terrace beds had been planted with flowers—a most commendable effort.

Naturally, the people of Sonoyta lead the simple life. With practically no market, either to supply or to draw upon, how could they do otherwise? They are not tempted to overeat, nor drink too much, and therefore their bodily ailments are very few. I was told that there is a long list of northern-city diseases of which they know almost nothing. Think, oh! ye New Yorkers, of living in a place where tuberculosis, pneumonia, diphtheria, cancer, mastoiditis, laryngitis and appendicitis are prac-

* *Punica granatum.*

tically unknown, even "by hearsay!" Nervous prostration is as impossible in Sonoyta as happiness is to an American countess.

Unconsciously I found myself pitying the Sonoytans because they have no post-office, and no regular—nor even frequent—communication with the outside world. But after all, why should I? What is the outside world and its turmoils to them? Why should they be moved to indulge ambitions and desires which they cannot possibly gratify? It is not kind to educate people into desiring a lot of things that they cannot have, *and do not need!* With remote and primitive people, who are handicapped by time and space, and in the case of savages by inheritance, it is by no means always a kindness to spread before them the curious crazy-quilt which we proudly call "civilization"—the most astounding mixture of virtue and vice, of goodness and meanness, of wisdom and idiocy that a finite mind can measure.

I asked some one, "When a man becomes ill in Sonoyta, what is done about it?"

"Oh, his own family, or some of his friends, take care of him the best they can, and give him the best medicines they happen to have."

"But is there no one in the settlement so skilled and experienced in dosing sick people that he is called 'doctor'?"

"*No one*, so far as I know."

"When the mothers bear children, what happens?"

"The women take care of each other; that is all."

"Do you recall anything like an epidemic here?"

"No; or at least not in recent years."

We were well pleased by the treatment we received at the hands of the men of Sonoyta with whom we had occasion to do business. We expended there, all told, nearly $300 in the hire of horses, mules and men, and in purchases; but not once did the hydra-head Graft monster, he of the seven heads and ten horns, rise and threaten to devour us. The people did not once overcharge us because we were strangers with money, and in need of things. For the eight horses that we hired, the price was only fifty cents each per day, in gold; and it was very reasonable. And Mr. Escalante's attitude about the wagon we hired of him was admirable. Owing to a slip of somebody's pen, the free admission of our wagons into Mexico was not provided for; and it made us a little trouble.

Finding ourselves under the necessity of hiring a wagon for the westward journey, some one went to a serious-faced, elderly Mexican farmer with a terribly deep voice, to engage the use of one owned by him. We simply *had* to have it. And Mr. Escalante said to George Saunders, when our men went to fetch it,

"This wagon is *not good enough* for a trip to Pinacate! It is old, and dry and shaky. I don't believe it can make so rough a trip without breaking down, and causing those gentlemen much trouble. They should have a better wagon than this!"

Now, it seemed to us that no statement could have been more fair than that; and when we heard of it—at the end of the trip—it made us think.

And this brings me to the very important business of getting into Mexico with an outfit such as ours, and getting out again, without the payment of a really large sum in customs duties. Be it known that, like ourselves, the people of Mexico believe in high tariffs, and the development of home resources. Had we been obliged to pay duty on everything in our outfit that really was dutiable, the demnition total would have run up to perhaps $500—and we would not have made that exploration! But the Mexican Government always has been liberal in its treatment of scientific expeditions, such as ours really was, and more than once has admitted outfits duty free.

Long before November, Dr. MacDougal made a formal application to the proper department of the government at the City of Mexico, for permission to enter Sonora and return again, with all our horses, wagons, arms, implements and necessary supplies, without the payment of duty. This request was duly endorsed by our government.

After the usual necessary correspondence, the Mexican Minister of Fomento, whose Department possibly corresponds to our Interior Department, resolved to grant the necessary permission. After an expenditure of about $40 in telegrams, the matter was arranged with Mr. Arturo Elias, the Mexican Consul at Tucson, who acted for the Mexican Collector of Customs at Nogales.

In order to insure our admission at Sonoyta without let or hindrance of any kind, a detachment of the Guarda Armais Fiscal, headed by Teniente (Lieutenant) Jesus Medina, was sent along the boundary from Nogales (120

miles of tedious and wearisome riding) to receive us in state at Sonoyta.

We found El Teniente and his escort of half a dozen men awaiting our arrival, having reached Sonoyta a day in advance of us. The Lieutenant was a highly interesting personage. The heat and the winds of the deserts, over which he has for all his life been eternally riding, have tanned and weather-beaten his countenance until his complexion is now very dark. He is now about fifty years of age, and therefore still in his prime. His home is at Nogales, and his line of duty stretches along the International Boundary for 200 miles.

Of course Teniente Medina had in his possession full instructions regarding our expedition. By the time we had outspanned and made camp, he appeared, walking across the bare fields from the group of houses on Main Street, accompanied by his staff. He greeted us most cordially, and without any unnecessary loss of time Señor Medina and Dr. MacDougal sat down to compare documents and make our entry an accomplished official fact. All went well until in the comparison of schedules of our outfit they reached the item of wagons; and then it was found that through some mischievous inadvertence both our wagons had been entirely omitted from the list furnished El Teniente by the Mexican Customs Officials in Nogales!

Here was an annoying situation, for which no one present was in the least to blame. Lieutenant Medina was greatly disturbed.

"It is perfectly plain," he said with great fervour,

"that my government desires that your expedition shall be admitted and facilitated; and of course you need your wagons in order to proceed. But my authority is found only in this official list of what is to be admitted free of duty! I dare not assume the responsibility of exceeding my instructions, much as I would like to do so."

It was plainly evident that Teniente Medina was both annoyed and distressed. There was no opportunity to arrange the matter quietly and informally between Dr. MacDougal and himself; for all the while half a dozen men of two nationalities had been idly but respectfully looking on, and listening to every word. In the presence of so many gossipy witnesses, there was really nothing for the Lieutenant to do but to uphold the dignity and regularity of his office by adhering to the letter of his written instructions; which he did with many protestations of annoyance and regret.

To have paid duty on our two wagons would have cost us about $100; and the annoyance of it would have cost three times as much more. Finally, after a conference with Mr. Milton, Dr. MacDougal made this proposal:

"Teniente Medina, this situation is the fault of neither of us. We must overcome it the best way we can. Señor Milton has from your government a permit for the use of one wagon on your side of the line. With your permission, we might use our large wagon under that authorization. For the other, we will hire a wagon here, of Señor Escalante, and at once return our second wagon to the American side of the boundary, to be held there

awaiting our return. Does that arrangement meet your approval?"

"Perfectly, perfectly, Doctor. It will be a great relief to me to see the matter so easily arranged."

And thus, at a total cost of only $9 in American money, for wagon hire, plus some wear and tear to our nerves on account of that very shaky wagon, the situation was saved. Whereupon our midday meal being just then served with the best that our outfit afforded, El Teniente was invited to lunch with us. He accepted, with the utmost cordiality, and we all sociably sat down upon the ground around our canvas table-cloth and dined sumptuously.

To our surprise—and also our gratification—Lieutenant Medina positively declined to inspect our outfit otherwise than as it appeared on paper. We expected that, as a matter of course, he would wish to go through the formality of examining our belongings, and checking off the articles enumerated in the official list; but he would not consider it for a moment. And for a man who already had ridden over 120 miles for the purpose of formally entering our outfit according to an official programme, we thought his attitude rather handsome, and we heartily commend his example to our countrymen. He even offered to accompany us to Pinacate, with his escort, if thereby he and they could render us any service; but of course we assured him that was unnecessary.

The most interesting man in Sonoyta, or for that matter for a hundred miles around, was Mr. Jefferson Davis Milton, U. S. Inspector of Immigration, of whom we saw much. By the invitation of Dr. MacDougal, Mr. Milton

had procured thirty days' leave of absence in order to accompany us, as our guest, from Sonoyta to Pinacate and back, for the pleasures of the exploration. It should be stated here that Mr. Milton's official duty is to patrol the International Boundary between the Colorado River and Nogales, "or as much thereof as may be necessary," in order to beat back any waves of interdicted immigration that may roll up from the south. He is, of course, specially aimed at the Chinese who occasionally seek to enter our very exclusive territory by way of Mexico—as if those industrious and peaceable people are undesirable in comparison with the Sicilian cutthroats who annually and freely pour into New York to engage in the business of blackmailing and murdering respectable Italians, without limit.

Mr. Milton is a man of large size, commanding presence, cheerful disposition and restless energy. In camp and on the trail his good humour is almost constant, and I enjoyed his company very much. Our friend "Jeff" is a man of many adventures—with a possibility of more to come. As express messenger in a country of train robbers, and in other capacities also, he has seen some stirring times. In a famous battle with train-robbers who attempted to clean out a Wells-Fargo Express car that was being guarded by Mr. Milton, he received a 45-calibre rifle ball diagonally through his left arm, which cut out a three-inch section from the middle of the humerus, forever. That arm is of course distinctly shorter than its mate, and although in active service, its strength has been seriously impaired.

In the course of our rides in company over the deserts and lava, and our talks across the camp-fire, Jeff told us a number of thrilling tales of his adventures. Once I said to him,

"Mr. Milton, how many times have you been shot at?"

"That's more than I could tell you, sir, to save my life," he answered. "You see, I haven't always known just how many times the other fellows fired!"

"And how many times have you been hit?"

"Oh, five or six times, I guess."

By a curious coincidence, Professor W. P. Blake, of the University at Tucson, who came out to see us off, was on the very train which those express robbers held up; and it was upon the mattress furnished by him from his bed-roll that our friend Jeff—"the messenger with his arm shot off"—was made half-way comfortable in the assaulted baggage car as the train ran on to El Paso.

Mr. Milton is a keen sportsman, and also was as much interested as ourselves in solving the mystery of Pinacate. When we reached Sonoyta he was ready to join us, which he did, together with his friend George Saunders, of Philadelphia, two horses, and two pointer dogs named Rex and Rowdy. Saunders proved to be a very agreeable and also helpful addition to our party, and he soon won the respect and friendship of all the members of the expedition.

Naturally, Mr. Milton was exceedingly helpful in Sonoyta—as well as everywhere else—in assembling the additional horses, horse-feed, wagon and other things that were necessary for the final half of our journey.

From a photograph by J. M. Phillips.

Desert Vegetation and Jeff Milton

Ocatilla in Full Leaf. White Salt Bush.

At the best, however, this took a little time, and it was decided that we would spend one extra day in camp in the Oasis. Dr. MacDougal needed to botanize in that vicinity, and take photographs of a number of important plants and trees, while Mr. Phillips and I greatly desired to go on a little hunt for peccaries in the Cubabi Mountains, about eight miles south-east of Sonoyta.

And there being no objection, it was so ordered.

CHAPTER IX

A SMALL DEER HUNT TO THE CUBABI MOUNTAINS

Cubabi Peak—Coyote and Skunk—Rain in the Desert—Disagreeable Trait in Mexican Rural Guides—A Fertile Mountain Valley—Enter Coues White-Tailed Deer—The Repression of Charlie—Death of a Doe—Its Size and Food Supply—A Downpour and Darkness on the Desert—Mr. Sykes Comes In.

On the ninth day of November, while various horses and other outfit features were being assembled, and the Chief went off on a botanic-photographic diversion, Mr. Phillips and I went hunting, ad interim, to the Cubabi Mountains. That tall range loomed up so near at hand, and looked so game-infested, that nothing less than a try-out ever would have satisfied us. The rough peaks and ridges looked eminently fit for sheep, but Charlie Foster assured us that "boregos" were not there.

From the first moment that he viewed it, Mr. Godfrey Sykes had yearned to carry his aneroid and plane-table to the top of the highest peak of Cubabi; for he believed the mountain to be not nearly so high as certain over-liberal geographers had set forth. On some maps it is actually put down as 9,457 feet.

It was resolved that Charlie should pilot all three of us to the range, and that Mr. Sykes would then go on alone to climb the peak, while the rest of us looked for peccaries and deer.

We rode seven or eight miles through a flourishing desert jungle, and finally reached a likely arroyo that came down by a short run from the backbone of the range. Mr. Sykes gladly abandoned the rest of us to our own devices, and rode on, conquering and to conquer; and with profound thankfulness that we were not compelled to climb old Cubabi merely to oblige a sceptical aneroid, we tied our horses to the mesquites and began to look for game.

The first thing I discovered was that Mr. Phillips and Charlie had quietly moseyed off together, and I was left alone. This so piqued my pride of conquest that I immediately climbed to the top of the highest ridge of those near me, and found the remains of a large skunk that had very recently been killed and eaten by a coyote.

The coyote surely is an ornery beast. I know of only one in America who is more so, and he is dead. That was the railroad laborer down in Virginia who last year shot a turkey-buzzard, cooked it and ate it all alone, and was killed by another I—that is, by another man, who objected to his selfishness in dining on buzzard all alone and in camera.

That skunk once had been a bushy-tailed, truculent pirate of the species named *Mephitis macrura;* and what think you his coyote Nemesis had left of him? Absolutely nothing but his tail and his jaws! Apparently he knew the paramount importance of dentition as a means to an end in scientific identification, and he thoughtfully left the teeth intact.

This tragic incident proves once more that even among

animals there is no accounting for the differences between tastes. Now, we all know that even in New York there are people who—but why pursue a subject so painful?

While searching the landscape o'er from the top of my ridge it *began to rain*—in the desert! As soon as I could recover from the surprise of it, I hastily searched out an overhanging ledge of rock on the lee side of the mountain, and in this niche I crouched to keep dry. No rabbit nor pack-rat came creeping in to join me and waltzed on my shoes; no deer sauntered by at short range; nothing at all happened. And there are men who under such circumstances always attract a lot of animals.

The rain penned me there among those cold, bare granite rocks for nearly an hour, so it seemed, and I saw no living thing of the animal world. But for the rain pattering on the rocks and glancing off the knees of my knickerbockers, everything was very, very silent up there, and the living world mighty far away. No wonder bad men often give themselves up to be tried, sociably, and even hanged among their fellows, rather than live on in solitude in mountain or forest. The wild life is all right—when not taken in too large doses, nor under too strong compulsion.

When the rain ceased I hunted all through the likely spots near me, saw nothing, and finally returned to the horses—just five minutes ahead of my companions. They, too, had found nothing; so we mounted and rode on about three miles farther.

At last we came to a fine arroyo, which came a long distance down, out of a mountain valley. The breadth

of it and its fine grasses spoke well of it as a resort for large game; so we quickly dismounted and prepared to search the place diligently.

On that occasion it was Mr. Phillips who wandered off alone, and left Charlie Foster and me to our own devices. On finding myself alone with a rural Mexican guide, it was then borne in upon me with extra force that of all earthly guides for big game the armed Mexican of the country is positively the worst. It is not because they are poor hunters, or bad stalkers; for they are very good both at finding game and getting up to it. The trouble is that, in the presence of big game, the rifle-carrying Mexican guide *loses all control of himself*, and at once opens fire, regardless of his duty to the sportsman.

Naturally, no man in his senses travels 3,000 miles to see a hired Mexican kill game. Dr. MacDougal has had experiences on the Peninsula that would have justified Mexicanicide; all of which was fresh in my mind as I marched beside my companion up that jungly arroyo. During the trip down from Tucson, Charlie had been very plainly admonished that there must be no wholesale killing of game, and that no one must ever shoot a female animal except to preserve it entire as a museum specimen, to be mounted.

That was a lovely valley, a hundred yards wide of level ground with a dry-sand stream-bed meandering through it, steep mountains close by on the right, and a high, rough ridge of bare rock on the left. The vegetation was as usual in such places—trees of mesquite, palo verde and ironwood, a few desert willows fringing the arroyo

and a scattering of cacti of three species. There was also an abundance of good bunch-grass. Both for peccaries and deer, the spot was ideal.

Cautiously we stalked forward, for half a mile or so, and presently found deer-tracks. A dozen times I thought,

"If we don't find peccaries here, we wont find them anywhere!"

Like the spring of a trap, up jumped two gray-coated animals, minus horns, and after three or four leaps stopped short to look at us. Distance, seventy-five yards. They were small deer, presumably females. One was in good view, the other hidden.

And, quick as a trigger, Charlie Foster lost his head—if ever he had one for orthodox guiding. He threw his rifle to his shoulder and, standing squarely in front of me, took aim to fire.

"*Charlie!*" I said, very sternly, "*stop that! Don't you dare to fire!*"

Greatly startled, he lowered his rifle; but goodness! how he looked at that deer! His face was a study of the human predatory animal held in leash, and plumb rebellious.

"Shut! *shut quick!*" he begged.

"It's a *doe!* We don't want it!"

"Shut! Shut! *Shut quick! We want the mit!*" (meat).

Then I thought of my duty to the Carnegie Museum—for a mountable pair of deer skins—took quick aim, and fired.

The deer sprang forward, made half a dozen bounds, and fell dead; shot squarely through the heart and lungs. At the same time a large fawn bounded into view on the other side of the arroyo and halted for ten seconds. And "*Whang!*" went Charlie, squarely at it; but he never touched a hair of it. It bounded wildly up the ridge, crossed it in flying leaps and disappeared.

Charlie Foster rushed forward to the dead deer. Without exaggeration, he was fairly overjoyed by the kill, the accession of meat—and success. It was a full-grown female Coues White-Tailed Deer—also called Sonora White-Tail,* a small tropical offshoot of our robust northern White-Tailed Deer.

My first feeling was of regret at having killed a doe, but later on this vanished; for *no other deer were seen on the entire trip!* It was well that I followed my old rule in collecting.

But Charlie had no qualms of conscience. Like Alan Breck after the fight in the round-house of the brig *Covenant*, no sooner did he lay hands on the dead game than he began energetically to hum a Mexican tune; and all unconsciously he kept it up, burring melodiously between his lips until the deer was placed on his horse. It was really very amusing.

I wished him to bring his horse to where the deer lay; but no! he *would* carry the animal half a mile down to where the horses were tied. It was a pleasure to him to do it! I then saw that he had been almost bursting with anxiety to take back *game of some sort.* Had I calmly

**Odocoileus couesi.*

permitted that deer to escape without firing at it, I surely would have lost his respect, forever, and a day after.

On reaching the horses, and my game scales, our first act was to weigh the little creature; and its gross weight was 71½ pounds, for a fully adult female. Its shoulder height was 28½ inches; length of head and body 47½, tail vertebrae 7½; neck circumference at throat 10, and a girth of body 28¾ inches. Its stomach was well filled, chiefly with the fruit of the barrel cactus (*Echino-*

Texas White-Tailed Deer
(Odocoileus virginianus)

Coues White-Tailed Deer
(O. couesi)

cactus), supplemented by leaves of the mesquite, desert willow (*Chilopsis*) and bunch-grass.

I lamented the fact that our deer was not a full-grown and fully-antlered male; and then Charlie Foster, who always strove to please, save when killable game was in sight, walked off up the arroyo. In five minutes he returned, bearing on his head an absurdly small pair of fairly-fresh antlers of Coues Deer from a buck slain by him the previous year. In order that their miniature size may be appreciated, they are figured herewith, in comparison with an average pair of antlers of northern white-tailed deer. The pair of *couesi* measure 13 inches in

length on outer curve, their widest outside spread is $14\frac{1}{2}$ inches, circumference above the burr $3\frac{1}{8}$ inches and the points are 4 + 4. This species ranges from southern Arizona south-eastwardly through the state of Sonora, Mexico, to Tampico. It is about the size of the Florida deer (*O. osceola*), and the Yucatan deer (*O. toltecus*). Charlie Foster said he had found deer every time he had visited the valley in which we made our kill.

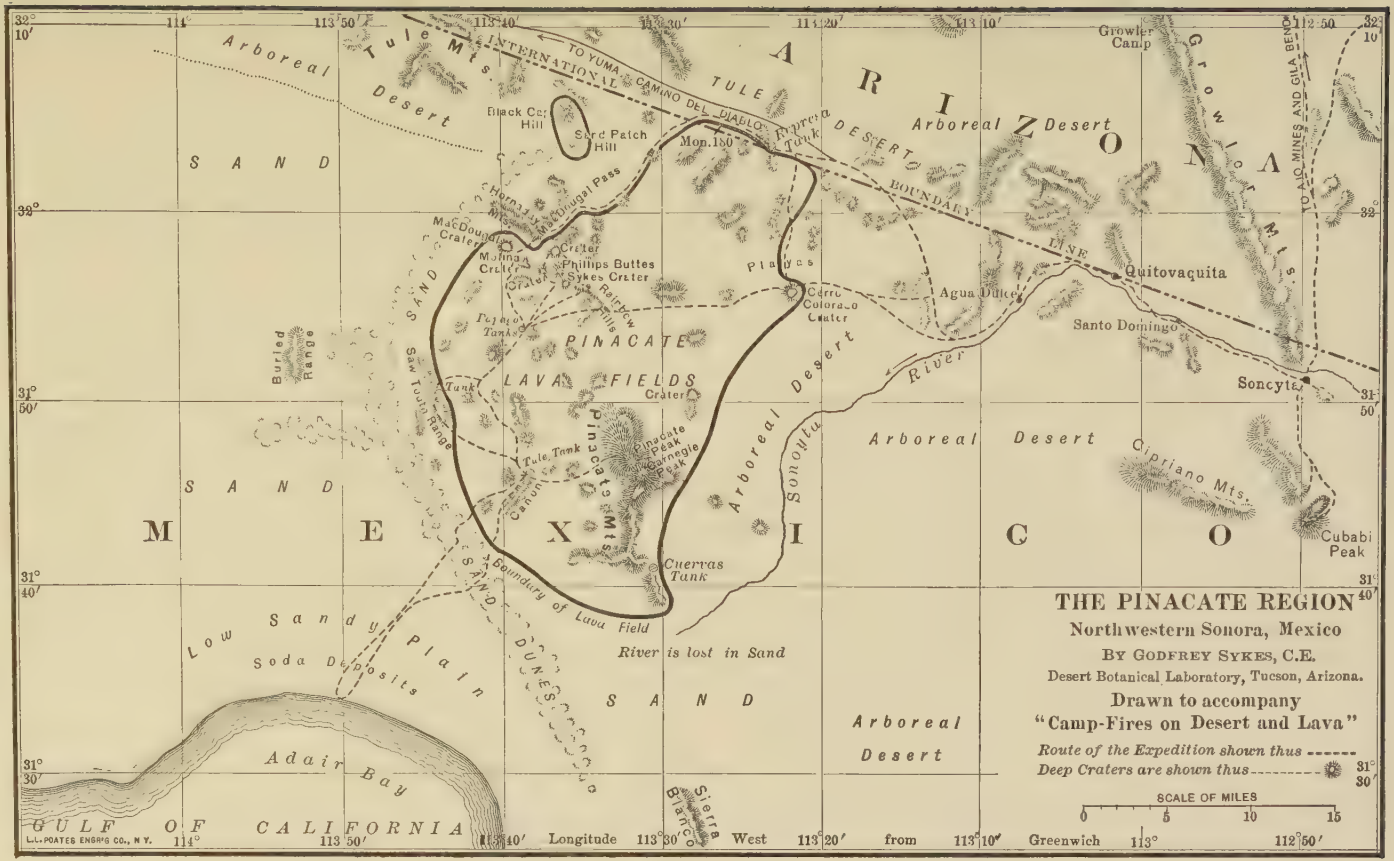
Mr. Phillips joined us as we were placing the deer behind Charlie's saddle, and we started home without delay. At the same time it began to rain and grow dark, and the more we hastened the harder it rained. Darkness overtook us about four miles from Sonoyta, with the trail full of water, and the rills beginning to run. We were thoroughly soaked; and our shoes were so completely waterlogged that they overflowed at the top. It is not joyous to ride four miles through darkness with one's shoes full of cold water, all the way splashing through puddles, and wondering why on earth Sonoyta does not appear. The low hills about us were useless as landmarks for the settlement, for they all looked precisely alike. For myself, I was right thankful for Charlie and the steady onward splash and squash of his horse's feet, for without him I am sure we could not have found Sonoyta through that murk.

After a ride that seemed interminable we reached Sonoyta, and our camp. To our joy, we found that the tent was up, and everything snug. Our arrival was greeted with lively satisfaction, until the deer was put in evidence; and then the surprise, and delight, and "*con-*

gratulations" that followed over that absurd little jack-rabbit of a deer made me feel as if I had been caught stealing a sheep. But, in the language of every modest recipient of an Ovation, I accepted that welcome, "*not* as being offered to me *personally*, but rather to the Great Interests that I have the *Honor* to represent on this Occasion"—the first fresh meat in camp.

But what of the Geographer? Mr. Sykes was not in; and he was wanted, very much. Judging his bump of "locality" by my own, I rashly predicted that he would not find Sonoyta that night. Dr. MacDougal alone thought differently; and, sure enough, about nine o'clock, which was three hours after darkness set in, in came the Geographer, waterlogged but serene. He had climbed to the top of Cubabi's highest peak, found it to be 4,300 feet high, and his only complaint against the weather was because the rain-clouds had enveloped him so completely while on the summit that he could record no observations on his plane-table.

To be rain-soaked on our first day in *el desierto* of Sonora, and thoroughly chilled, also, was like being prostrated by heat in Greenland; and wondering what next would happen to us unexpectedly, we thankfully devoured a shameless meal, and crept into the snug comforts of our sleeping-bags.


THE PINACATE REGION
Northwestern Sonora, Mexico
By Godfrey Sykes, C.E.
Desert Botanical Laboratory, Tucson, Arizona.
Drawn to accompany
"Camp-Fires on Desert and Lava"
Route of the Expedition shown thus
Deep Craters are shown thus
SCALE OF MILES
0 5 10 15
Longitude West from Greenwich
ARIZONA
MEXICO
Arboreal Desert
Tule Mts.
Black Cap Hill
Sand Patch Hill
Mon. 180
Represa Tank
TULE DESERT
TO YUMA CAMINO DEL DIABLO
INTERNATIONAL BOUNDARY LINE
Growler Camp
Growler Mts.
TO AJO MINES AND GILA BEND
Quitovaquita
Santo Domingo
Soncyta
Agua Dulce
Cerro Colorado Crater
Playas
Hornaday Mts.
MacDougal Pass
MacDougal Crater
Molina Crater
Phillips Buttes
Sykes Crater
Rainbow Hills
Papago Tanks
PINACATE LAVA FIELDS
Crater
Tank
Saw Tooth Range
Buried Range
Tule Tank
Pinacate Mts.
Pinacate Peak
Carnegie Peak
Canon
Cuervas Tank
Sonoyta River
Cipriano Mts.
Cubabi Peak
Boundary of Lava Field
River is lost in Sand
SAND DUNES
Low Sandy Plain
Soda Deposits
Adair Bay
GULF OF CALIFORNIA
Sierra Blanco
L.L. POATES ENGR'G CO., N.Y.

CHAPTER X

DOWN THE SONOYTA TO THE LAVA

The Start Westward—Bad Mules—"The Devil's Road"—A Ruined Hacienda—A Lonesome Little Cemetery—We Meet Mr. Daniels—The Sonoyta River in Flood—The Water-Storage Cactus—A Rattlesnake in Camp—Quitovaquita, on the Boundary—Rube Daniel's Passion for Powder—An Accident—A Japanese Incident—Pinacate from Afar—Another Rattlesnake in Camp.

At least one of us had expected that westward of the blessed little Sonoyta Oasis we would find the river valley quite narrow, and lying between two ranges of steep mountains. But once more our expectations required revision. The Sonoyta Valley is several miles wide, and its general surface is not nearly so level as the floor-like valleys west of Tucson. On the south, the nearest mountains—after the Cubabi Range—are a goodish bit away, but on the north the Quitovaquita and other mountains are really quite near. Pinacate Peak, our goal, is not visible from the lower levels of Sonoyta, being "hull down" on the south-western horizon, but from the hill north of the oasis, on which stands Monument No. 168, its rounded summit may be picked out from the maze of peaks to the south-west.

On November 10th, we overhauled and re-formed our outfit for the westward journey to Pinacate. Dr. MacDougal had hired four saddle horses, and a pair of mules

as leaders for the Mexican wagon. The former were all right, but, lawyer-like, the mules "objected" to nearly everything that the opposing counsel did, or tried to do. When we overruled them, they always noted an exception. Sometimes they did it by jumping out of their harness, and sometimes by trying to climb into the wagon beside the driver.

At first one of those mules was a great stickler for ceremony. He insisted upon being hobbled and blindfolded whenever his harness was put on, and the teamsters were very patient in letting him have his way. In bridling that animal Jess Jenkins was an artist, no less. First he would speak gently to the erring one; then, holding the halter in his right hand, close up, his left hand would slide slowly and gently up the skull of that mule until it reached the level of the eye. As softly as a lover does it, that mesmeric hand would glide westward until it reached the upper lid of the eye, and, in most affectionate fashion, the orbicular muscle was deftly gathered between the thumb and finger.

And then, what a *pinch* was there, my countrymen! The pain was so great and so exquisite that it would have diverted a rocking-horse; and before the wild mule could realize what was being done, and why, the bridle would be in its place, and the harness on. Strange to say, however, that mule never seemed to remember from one day to the next the intimate meaning of that seductive hand.

At first those mules always kicked on the hitching of the traces; but at last, after many wordy arguments, they

From a photograph by D. T. MacDougal

Santo Domingo, Looking North-westward

conceded the necessity of hooking up in order to get on in the world.

There were long days when either Jess Jenkins or George Saunders tramped on foot beside those wild mules, prod in hand and fire in eye, to encourage them, while the other sat on the high seat, driving and enjoying life—not much.

Mr. Milton owns two dogs, a pointer and a pointer-mixed. There being no one with whom to leave them, it was absolutely necessary that they should accompany the expedition; which they did; but no efforts of mine ever can do justice to their talents.

Dr. MacDougal also considered the advisability of taking along a Papago Indian as a guide, but finally decided not to do so. Of this decision we were heartily glad, particularly when we learned, two months later, that two New York sportsmen, in the Lower California Peninsula, were practically set on foot by their rascally Indians, who treacherously took away all their horses and left them at the most remote point of their journey.

The trail that leads westward from Sonoyta eventually enters the Tule Desert, about thirty miles along the international boundary, and there it becomes the famous Camino del Diablo, or "Devil's Road." It leads to Yuma, on the Colorado River, at the mouth of the Gila; and I suppose that it derives its name from the fact that *between three hundred and four hundred* wayfarers have died on it, of thirst, famine and fatigue. It is said to be the most terrible desert trail to be found in all the south-western arid region; though that would appear to be a large order.

The trouble is that the water-holes are very few, very far apart and much given to failing entirely in extra-dry seasons. The water in the Tinajas Altas tanks is at all times very hard to get, and in places the trail is very sandy and very rough. On the Tule Desert, however, we found it fine.

About six miles west of Sonoyta are the remains of what once was another oasis—a very small one, to be sure, but once very flourishing. It is called Santo Domingo; and Sonoyta never in its life had such buildings as those now rapidly going to rack and ruin. Once it was a Mexican hacienda, for fair, and even six years ago it was an imposing centre of life and activity. On a fine knoll, the trail becomes a street. On one side stands a huge adobe building 125 feet square, with the usual open court, or patio, in the centre. The half score or more of rooms into which the building was divided once housed many industries—a flour-mill, a soap factory, a blacksmith-shop, storerooms of many kinds, men's quarters and I know not what all else. Near by are extensive corrals for stock, still intact, and occasionally used.

On the other side of the street was a solid block of six houses, each twenty by thirty feet, five of which had been occupied by the chief people of the place, as dwellings. One had been The Store; and the abandoned furniture and fixtures spoke silently of vanished business. A building thirty by fifty feet, that stood a little farther along the street, had kalsomined walls and a coloured dado, betokening special importance. I was told by a native that it once was the custom-house. But, as usual with unoc-

cupied adobe houses, the roof had already fallen in, and ruin was in progress.

North of the buildings were level fields that once had been irrigated from the reservoir made by the waters of the Sonoyta River. There had been rows of fig-trees along the canals, but they had died of thirst; and so had the grape-vines that now extend their skeleton arms in mute protest over what once was a flourishing vineyard.

An important relic of the past was found adjoining the corrals on the west. It was an abandoned ore-crushing plant, of the Mexican kind known as an arastra. The machinery was made in Brooklyn; and think of the toil it was to bring it to Santo Domingo! The ore for the industry was brought from the Cypriano Mountains, twenty miles away toward the south.

We were told that recently, when Santo Domingo was most flourishing, Sonoyta was for several years utterly abandoned, because of the destruction of the water-works that irrigated the oasis. Now, the tables are turned once more; but four years hence the traveller may be surprised by seeing Santo Domingo once more humming with life.

Dr. MacDougal and I climbed up to a pathetic little cemetery that occupies a rocky hilltop a short distance south-eastward of the hacienda. It looked awfully lonely and forgotten. There were seven graves, four of which were provided with rudely made wooden crosses, but all of them, save one, had fallen down. The most imposing tomb bore a hardwood cross, which had been carved with

loving care and much labour. The cross-arm bore this inscription, in letters carved with clumsy tools:

AQUI YACEN LOS RESTOS DE EMILIA C. DE CARREVAS
R P
QUI FAYECIO EL 13 DI JULIO DE 1877. LA EDAD 50 ANOS.

(Here lies in the grave, at rest, Emilia C. de Carrevas, who died on the 13th of July, 1877. Aged 50 years.)

The upright bore another inscription, evidently designed to express a Spanish equivalent for our "In loving memory"; but the student of pure Castilian who endeavours to look up "yacen" and "fayecio" in a dictionary will have trouble. In this case both words have been spelled literally as they sound, with y instead of ll.

A fallen cross bore a woman's baptismal name which so strongly appealed to my sentimental inner self that I was at some pains to set it up again, in tribute to a Lady whom I know. It said:

AQUI LLACEN RESTOS DE
JOSEFA ORTE

(Here lies in the grave, at rest, Josephine Orte.)

All the graves save one had been securely sealed with adobe, and were well preserved. The exception was the grave of a child, which had merely been filled full of stones that were none too small. A vandal pack-rat had invaded the resting-place, carried up all the loose

From a photograph by D. T. MacDougal

Details of Typical Desert Vegetation on Hilltop at Santo Domingo

Pack-Rats' nest; a new species of cactus—*Opuntia Kunzei;* creosote bushes; skeleton of a dead tree choya in left middle distance; two white cottonwoods in distance, near river; and in upper right corner an *Opuntia versicolor*

earth, and many of the bones of the poor little skeleton, all of which lay scattered about as the Imp of the Desert had left them. To even matters, however, *Neotoma* had collected a lot of joints of a small-jointed choya, and stuffed them into the crevices. And now Science steps in. Dr. MacDougal has just written me the information that those cactus joints are from a choya that is a new species, described and christened quite recently as *Opuntia Kunzei*.

From the Hill of the Lonesome Cemetery, Dr. MacDougal made a very fine photograph of Santo Domingo, and the vast bush-covered plain beyond, which is respectfully submitted.

A mile westward of Santo Domingo we met three horsemen, all Americans, from Quitovaquita. One of them was introduced to us by our Mr. Milton as "Mr. Daniels," and after we had exchanged a few platitudes in the usual way, we reined up to ride on. It was then that Mr. Milton said:

"Well, come on, Rube, and camp with us. You know, gentlemen, Mr. Daniels is going with us."

Blank surprise sat on all four of us. Finally some one managed to say, faintly,

"Oh! Is he?"

"Yes," said Jeff, briskly, "he knows the country around Pinacate, and I've invited him to go with us, *as my guest!*"

This was a surprise. Up to that moment we had thought that our good friend Milton was *our* guest; and the addition of his friend Saunders had been duly proposed

in advance, and approved. We had nothing against Mr. Daniels, but to have him and his two horses thus dropped from the clouds into our midst was an unhappy sort of an introduction. However, Dr. MacDougal was the last man in the world who would discredit our good friend Jeff, or put him to embarrassment. As soon as he could orient his thoughts, he made Mr. Daniels welcome to our party, and we all rode on westward together.

A ride of another mile brought us to the crossing of the Sonoyta River; and then we found that the rains of the previous day, and also those of the afternoon—between Sonoyta and Santa Domingo, when *three distinct rain-storms* fell simultaneously north and south of us—had made good. Glory be! We found the Sonoyta *in flood*, filling its wide bed from bank to bank! The sandy-brown current rushed along in great waves, a hundred and fifty feet wide, weltering and murmuring nervously as it ran, as if in the greatest haste to get on. My wish to see a desert stream-bed running full of water had been quickly granted, and I gazed in silent wonder at the novel sight—a flooded river in a desert!

Being in advance of my companions, it was my duty to ascertain whether the loaded wagons could get across that afternoon or not. I rode out into the boiling caldron of storm-water—dreading quicksands, and prepared for eventualities. Very soon I found that in mid-stream the water was at least four feet deep, and very swift. This meant that for loaded wagons, and a pair of wild mules for leaders, it would not be wise to attempt to cross that afternoon. The afternoon being well advanced—for our

From a photograph by the Author

The Sonoyta River in Flood, below Santo Domingo

An hour previously, the entire sand-bank in the foreground was under water

start from Sonoyta was rather late—we camped near the crossing.

Mr. Milton advised taking the whole outfit back to Santo Domingo—two miles—in order to camp there and procure hay for the horses; but Dr. MacDougal refused to take the back track. Mr. Milton insisted, and finally became quite cross over the decision, but very manfully apologized to the Doctor the following day. So there we camped; and all save four of our cavalcade of *seventeen* horses were taken back to Santo Domingo for the night, and there fed on hay.

The flood in the Sonoyta subsided very rapidly. As soon as possible after our camp site was selected, I went down to get a picture of the torrent. To my surprise I found that the water had lowered about a foot, and a wide sand-bank had been exposed, most conveniently for my purpose. Strange to say, my picture proved to be another accident on the right side; and there being no rival, I show it with outrageous pride.

It is strange that a stream-bed which is not more than thirty feet wide at Sonoyta should in eight miles widen to a bona-fide width of one hundred and fifty feet between banks; but even thus does the ephemeral little Sonoyta, the lower half of which no one had up to that time dared to put down on a map. As a matter of fact, in dry times not one drop of water runs beyond Santo Domingo. The rule of the river is that it will "go on forever"—until it totally disappears in its own thirsty sands.

The morning of our camp at the crossing is marked in our minds by two incidents.

Dr. MacDougal gave us a most interesting demonstration of the manner in which some desert plants store up water for use in dry seasons. A dozen yards from our camp-fire, under the arms of a spreading mesquite tree, he began to dig in the sand to reach the bottom of a small whip-like cactus. Above ground the stem of the plant was only five-eighths of an inch in diameter and fourteen inches long. From this modest and even insignificant 'bove-ground stem, very feebly provided with spines, a long, string-like root ran straight down into the sand for twelve inches. At that depth it developed a huge beet-like bulb thirteen inches long, fifteen and three-quarter inches in circumference on its equator, and weighing precisely three pounds! The bulb was of beet-like consistency, and very watery. No doubt the small stem above ground could have lived on the water stored in that root for two or three years, as a hibernating bear lives on his own surplus fat.

For convenience we called that plant the water-storage cactus; and Dr. MacDougal said that its Latin name is *Cereus greggii*.

As if to discount the above, no sooner had we photographed that specimen than some one discovered, snugly ensconced in the mesquite-brush fence about twenty feet from my bed, a cold and quiet rattlesnake. The chilly air of the night had rendered the reptile uncomfortable, and disinclined to move. Without ceremony he was hauled forth from his concealment and called upon to pose before Mr. Phillips' camera. The head snake-man of the party picked up the rattler on a stick, carried it into an

open space and deposited it upon a bed. At first his snakeship became nervous, and endeavoured to escape; but on being brought back three or four times and redeposited on the bed, it concluded that, after all, we were not wholly a bad lot. Then it assumed a defensive attitude, ceased rattling and calmly awaited our pleasure.

Naturally, we surrounded the bed on which stood the deadly serpent, but our presence did not disturb *Crotalus* in the least. Mr. Phillips photographed it several times at very close range, and the snake really looked pleasant, for a rattler. *It did not coil at all!* It raised the upper third of its body high up, maintained at all times a queer kink in its neck, for striking purposes, but remained perfectly quiet.

In order to furnish a proper background for the snaky subject, Mr. Milton lay down behind it, close up to the edge of the bed; but nothing untoward happened. At last, when the final film had been expended, the question of disposal arose. In pursuance of the Phillipsian principle, that nothing photographed alive shall be killed afterward, I carried the rattler back to his brush fence, dropped him into its midst and bade him go in peace. We left the spot sublimely complacent over having lived up to the Principle, but two or three weeks later we found that we were victims of misplaced confidence. In an unguarded moment Jess Jenkins gave to the press a gauzy story to the effect that after we had turned that rattler loose, "one of the horses stepped upon it, and killed it."

"Oh, yes," said Mr. Phillips, "and that was the first rattlesnake that a 'horse' ever killed with a club!"

Twelve miles from Sonoyta we came to Quitovaquita, and but for its glorious spring of clear and cold water pouring in a two-inch stream out of a rocky hole in the foot of a granite mountain, the memory of the place would not be pleasant. In the suburbs lay the remains of two dead coyotes that had been poisoned. One was a big, handsome red fellow, with a fine brush—far handsomer than any other that we saw on the trip. It was a pity that he was too far gone to find his way into a museum. Near him lay a fellow victim that was smaller, all gray with no red, and not nearly so handsome. The latter matched all the others that we saw, alive and dead.

Although Quitovaquita was entirely quiet and inoffensive, its atmosphere was depressing. It is one of the spots in which I would not like to die, and would hate to live. Of its eight houses, only four were inhabited, and the others were crumbling to the inevitable ruin that in every vacant adobe house follows swiftly upon the heels of the departed tenant. The waters of the spring have made a pond, but it looks stagnant and unwholesome. There are trees growing about the place, and a sprinkling of brush along the brook of the spring; but the settlement is not inviting. Perhaps this is because the little hamlet is a hybrid—neither Mexican nor American. The spring is American, by about a hundred feet, but the boundary runs right through the heart of the city. The spring irrigates one field, which is duly fenced against cattle and burros, but the waters of the Sonoyta River are not utilized.

Strange to say, we found that two Americans were living in that lonesome, stagnant, out-of-the-way place.

One was our newest friend and companion-in-arms, Mr. Reuben Daniels, and the other was a Mr. Childs, who owns a very good cattle-ranch, a fine well and a steam pump on the trail to Gila Bend, ten miles above the Ajo mines. Being curious to know why any American should settle there, I said to Daniels one day when there was a vacant interval,

"Won't you tell me what turn of fortune led you to settle in a place so little and lonesome as Quitovaquita?"

At first Mr. Daniels was rather surprised by this unexpected question; but after a keen glance and a moment's pause, in which he evidently decided that it was not put through any unfriendly intent, he replied very frankly,

"Oh, I'm not staying down here because I'm stuck on the country. Like everybody else, I'm looking for an opening, somewhere. But, after all, there are much worse places for a man to live in than little Quito and Sonoyta."

That was all that he cared to say on the subject, for he was at all times a man of few words.

As we halted briefly at Quitovaquita, Daniels put his bed-roll and war-sack upon one of the wagons, and led away with him his second horse. We found that previous to our visit he had been literally starving for cartridges, both for his rifle and his six-shooter. Of the large package of cartridges brought down by Dr. MacDougal for Mr. Milton, nearly one-half were turned over to "Rube," who straightway began to revel in them.

When firing was heard ahead of the main body, it turned out to be "Rube Daniels, shooting at a jack-rabbit." Later on, when a man was seen to fling himself off his

horse, kneel, and fire two or three times, it was "Daniels, killing a coyote." An hour later, another fusillade resolved itself into another conjunction of Daniels and jack-rabbit. No one tried to keep track of his killings. Although he killed a-plenty, the interesting point was that he was simply overpowered by his desire to shoot things! I saw him kill one coyote and two jacks, and I know not how much more he slew. He had the pastime all to himself, for no one else cared to fire a shot, save when the Doctor took in a western red-tailed hawk. To us it seemed rather odd that a cowboy would spend time and good cartridges—a hundred miles from a railroad—in shooting such dreadfully cheap game as jack-rabbits.

Later on, this absorbing passion for shooting led to a deplorable incident.

Westward of Quitovaquita the trail describes a big loop southward, chiefly for the laudable purpose of keeping as close as possible to the Sonoyta River. It was while we were crossing a high and bare bit of land overlooking the bed of the river, there fully 500 feet wide, that our Mexican wagon scored its first break-down. The iron thimble came bodily out of the wooden hub; and when it had done so, we saw that the wound was an old one, only superficially healed, and festering underneath with wooden wedges, strips of gunny-sack and goodness knows what not. The yawning cavern inside that hub seemed absolutely hopeless; but Mr. Sykes went to work with unruffled brow to doctor it up.

Near the beginning of the trouble, a lone man in black clothes "might have been seen," and in fact was seen,

From a photograph by J. M. Phillips

A Piece of Human Drift-Wood from Japan

From a photograph by J. M. Phillips

Mr. Milton Contemplates the Passive Rattlesnake

toilsomely wading across the river and the sand from the opposite side. He came from a thick patch of brush, and laid a course for our spot so straight it was evident that he wished to board us. At last Mr. Milton exclaimed,

"Why, it's *one of those Japs!*"

And this obliges me to turn back the pages of history, for one brief moment.

As soon as we reached Sonoyta, we heard, with keen interest, of five Japanese who had recently appeared in the Sonoyta valley, coming from the south, desirous—so they said—of reaching the *mouth* of the Colorado River! They knew no English to speak of, were very ill fitted out for travel of any kind, and seemed utterly unacquainted with the deserts. They proposed to walk along *el Camino del Diablo*—the Devil's Road—from Sonoyta to the Colorado River, without any outfit whatever, without arms, and with only two canteens for five men!

Against all advice, the quintet finally started westward, in due time passed Quitovaquita and launched out upon the Tule Desert. Then Mr. Milton posted after them, to see that they did not enter the United States. He passed them fifteen miles out; and they were tired, hungry, heated and knew nothing about the "next water." He gave them a canteen full of water, advised them to turn back immediately before getting into serious trouble, and rode on ten miles farther. As he returned, he found that three of the party had left the trail and gone off into the desert at random, while the other two had turned back, as he advised. The latter he presently overtook and passed.

A day later the two back-trackers reached Quitovaquita, where they were hospitably fed, tobaccoed and rested by Childs and Daniels. Two days before our arrival at Quito this errant pair had again started westward, for a second trial of el Camino del Diablo. Being strictly uncommunicative, save when they wished for succor of some kind, no one was able to gain even a hint of their reasons for wishing to reach the Colorado River below Yuma. By some it was suspected that they wished to slip into the United States somewhere near Yuma; but their method seemed insane.

The little brown man in black wearily plodded across the shallow river, slowly climbed the steep cut bank and stood in our midst. He might have sat for a picture of Up-Against-It. Instead of being emaciated, his face had an unhealthy, bloated appearance. He looked like a man ready to drop with weariness, loss of sleep, hunger, bad food and exposure. (Excuse me even from sleeping out in that country in November with less than two good blankets!) His wholly unsuitable black clothes and city shoes were badly torn and worn, and under the circumstances he was very foolish to wade the river without taking off his shoes and keeping them dry.

To cap the climax of his miseries, the poor little fellow could not speak a dozen words of English! He could say "tobacco" and "matches"; but they are English no longer. They are Universal. The smokers dug up tobacco for him, and the non-smokers furnished him with a good supply of matches, for all of which he repeatedly said "thank you," by touching his forehead with his hand.

He was given food of some sort; I do not remember precisely what it was; and then, with great earnestness, he began to talk in the sign language. Presently we made out that his partner was over in the thicket across the river, nearly a mile away, sick abed and unable to travel.

This tale of trouble he chose to address rather particularly to me, but at first his pantomime, intended to describe the symptoms of his sick partner in misery, was more than I could interpret. By dint of effort, however, we at last understood each other.

I brought out my medicine-box, produced what I believed to be the proper medicine, divided it into doses and explained by signs how often they should be taken. The wanderer took the stuff, most eagerly, and then, to my consternation, *he fell upon his knees in front of me* and touched his forehead to the sand, not once only, but three times, in real Japanese-courtier fashion! As sure as fate, this man had not been many days in North America! The acclimatized Japanese kneels to no one on this side of the Pacific; and any Jap servant will discharge his or her contracted employer, literally, "at the drop of a hat."

The wanderer stood for Mr. Phillips to get a picture of him, and that ended the interview. He turned away, climbed down the bank and drew a bee-line for the distant thicket where lay the sick friend whom he would not abandon. The last we saw of him, he was slowly wading across the shallows, back to more discomfort and hardships, and possibly worse—a human enigma from a very far-off shore. Heartily wishing him safely back in Japan —or in a good California vineyard, we cared not which—

we replaced our mended wheel and quickly resumed our march toward Pinacate.

Three weeks later, as we were leaving Sonoyta for home, we heard that the sick Japanese had recovered, that both of them had returned to Sonoyta and were then somewhere in the settlement. We hope, for their sakes, that they did not again try to go over the Devil's Road on foot, and guideless. There are men to whom I would be pleased to recommend that trip, on foot, and in hot weather; but those Japanese are not of them. What became of the other three Japanese? I do not know. They simply disappeared in the Tule Desert, and of them I can learn nothing more.

At this point the reader may well ask, *Why* were those five Japanese so strenuously endeavouring to break into the United States via the Devil's Road? A suggestion that they were merely bent upon reaching a field of quiet, honest and inoffensive labour would be, in my opinion, unadulterated nonsense. An honest workingman chooses the line of least resistance. They could have slipped across the border and up to the Ajo Mines in precisely two days; for even though our Inspector of Immigration is a husky and vigilant man, he is only one man, and the boundary is as many miles long as you choose to make it.

It is my belief that those five innocent-seeming Japanese represented a deliberate purpose on the part of the Japanese Government. I think their purpose was to ascertain by trial whether the Camino del Diablo is *a practicable route for men on foot who are poorly equipped!* I think those men were trying to demonstrate that it is

possible for the little brown men of Japan to travel from Altar to Sonoyta and Yuma with practically no "outfit" whatever; and if it were susceptible of proof, I would willingly wager that a full report of that attempt is at this moment in the hands of the Japanese bureau of intelligence at Tokio.

Just *why* the Japanese should wish or need to know the possibilities of getting into the United States over the Devil's Road, is a question for a military critic. All I know about the Japanese mind is that "it is sly, sir, devilish sly"; and it works while we sleep. Possibly there exists in Tokio an academic desire to know whether a fleet could find good lodging in the lower reaches of the Colorado River; but had that been the only question to be reported upon, our dilapidated Japanese friend would naturally—and easily—have sought the information by a comfortable *pasear* down from Yuma.

Mr. Rube Daniels told me that in Quitovaquita the members of the Japanese party had begged food and tobacco, and that a generous quantity was bestowed upon them in the belief that they were quite destitute. But, like Oliver Twist, they wanted "some more," especially flour and bacon; and when it was denied them, they promptly dug up *gold coin* from their inner pockets and *offered to pay* for what they required!

Agua Dulce (Water Sweet) is a name, a practicable corral, an abandoned adobe house on a nice, clean knoll nineteen miles from Sonoyta, and nothing more. It is on a high bit of river-bank, and from it there is a long view down the wide river-bed. The twin peaks of the Pinacate

Mountains loom up about west by south, shrouded in a blue haze. For three miles westward the green arboreal desert continues, then there slowly rises a wide stretch of dark ground, as if the space from the green desert up to the tip-top of Pinacate Peak were under the shadow of a thick cloud. Instinctively you look at the sun, but you see that the sky is quite cloudless everywhere, and by these tokens you know that the eastward slope of the mountain is perpetually dark!

This is something entirely new, for this trip. The Pinacate Mountains appear to be a lofty pyramid with an immensely wide base. At long range there are only two peaks that are individualized. Later on we found not merely a mountain peak, but a *range* of lava mountains, fully ten miles long, extending almost due north and south. As it appears in profile it looks as if the slope to the summit is so gradual that a horse might be ridden to the top; and from the north this is true. But we had absolutely no means of knowing, within several miles, the distance between ourselves and the highest peak, nor of judging either its height or its steepness.

It had been said that on account of our wagons we would find it advisable to swing around the base of the mountains on the level Tule Desert, and attack them from the north—a regrettable circumstance to four men who wished to charge straight at the enemy, and solve its mysteries in quick time. There was a great amount of talk, and map-drawing in the sand by Charlie Foster, but the sum of it all was that no one seemed to know in the very least what was before us, or how to get anywhere

save by sheer pathfinding. Charlie Foster and Mr. Daniels did know of the existence of a "tank" (water-hole) somewhere to the north-westward of the mountain, and it seemed to be vitally necessary to our exploration that we should find it.

We camped at Agua Dulce, and cached in the abandoned house a bale of alfalfa hay and a sack of barley for the return trip. It was one of the wisest moves of the trip; for on our return journey it was, to our hungry and jaded horses, worth much more than its weight in gold. For general convenience, our horses—now numbering *seventeen head*, and rapidly eating their own heads off—were tied in the corral and fed on hay that we had brought from Sonoyta. And this led to another incident.

Just as I was about to induct myself sinuously into my sleeping-bag, there was a sudden commotion below. Rube Daniels came rushing up from the corral, almost breathless.

"Will you let me take your lantern, please! There's a big rattlesnake in the corral, and it's about to bite one of the horses!"

At once all hands hurried down—Daniels leading the way with my lantern, while I carried the Doctor's shot-gun. Through the darkness we heard horses snorting hysterically, and voices saying, "*There it is!* Look out! Look out!" and "Take that horse away, *quick!*"

An angry rattlesnake mixed up in black darkness with three men and seventeen horses is not a thing to inspire serenity.

The serpent had taken refuge in the fastness of the

brush fence that surrounded the corral. The mass of stems, piled horizontally between two lines of upright posts, was about eighteen inches thick, and it was by no means a bad fortress for a harried snake. By the light of my friend Stonebridge's very excellent folding lantern—really the greatest of all lanterns for a camper—the rattling rattler was quickly located. He was then about three feet from the nose of a horse that was tied to the corral fence. He lay lengthwise in the pile, wide awake and angry, and was evidently ready either for fight or flight.

Mr. Daniels snatched from me the shot-gun, took careful aim and shot the rattler half in two at the middle, completely wrecking its spine.

Another flash of the lantern showed that the snake was quite done for; and some one said cheerfully, "It's dead!"

The lantern was withdrawn.

"Look out, fellers!" cried Daniels, excitedly.

Drawing his 45-caliber six-shooter he fired five shots, as fast as he could pull trigger, into the black hole in the fence, opposite the snake. Naturally we expected to find the rattler in a state of pulp, but a moment later, when we dragged it out, we found that not one of the revolver bullets had touched it.

That night the coyotes gathered around us in force, and it seemed to some of us as if our dogs spent half the night in barking at them and chasing them through our camp.

In the first rush, the dogs ran over the bed of Rube

From a photograph by D. T. MacDougal

The Sonoyta River at Agua Dulce

Near here the river strikes the great lava field, and turns due southward. On November 25th the last water disappeared here. Pinacate appears faintly in the extreme distance, twenty-one miles away, south-west by north

Daniels, and, quick as a trigger, he sat up, with his six-shooter in his hand and glared about him.

"What's the matter, Rube?" said Jeff Milton. "Are you dreaming?"

"I guess so," said Rube, and once more he composed himself for slumber.

More than once a wild and eager chase led across the bed of a sleeper, causing audible discontent within; for no man likes to be turned into hunting territory for large game. As the row went on, the hot language of seven men rose on the chilly air, and was lost in the vaulted ether overhead.

During the night our slumbers were frequently disturbed by some large wild animals that we had not counted upon; and what think you, perspiring Reader, that they were? Wild burros—donkeys—no more, no less. The desert about us contained dozens of them, all of them thoroughly man-shy, self-supporting and firm believers in the doctrine of the survival of the fittest. They find enough grass and green browse to live upon, and the Sonoyta River waters them. When the stream goes dry, they seek the moist spots, and with their hoofs dig holes in the sand for water. Mr. Phillips once found in the river-bed a large hole that had been dug by wild burros. On his return trip to Sonoyta he saw about twenty of those animals, and found that by imitating their cry he could ride up within one hundred yards of them.

In travelling through the Sonoyta Valley, we saw a number of those strange derelicts, but none that I saw would suffer us to approach them nearer than about four

hundred yards. Of course it is to be understood that they are merely domestic burros that have escaped and become wild, or else have been born of runaway parents.

That night at Agua Dulce they hung around our camp for hours, as if longing to return to the civilization they had voluntarily abandoned. Their hearts were very sad about something, for whenever there was a lull in the coyote war, a voice from the chaparral would rise through the lonesome darkness, and a heart-breaking "*Haw*-he! *h-a-w*-he! *h-a-w*-he!" would go wailing and screeching over the desert like the cry of a lost soul. And then about every half hour we heard galloping hoofs going "ke-*lop*, ke-*lop*, ke-*lop*"; and each time we wondered whether the dogs would stampede those sad-hearted wild beasts through our camp, and bring those hoofs upon us.

Nothing untoward happened, however; and between rattlesnakes, coyotes, dogs and wild burros the night pleasantly wore away.

CHAPTER XI

AN EVENTFUL DAY AT THE EDGE OF THE LAVA

The Finest Organ-Pipes and a Red-Tailed Hawk—The Alkali Plain—The Ocatilla's Flower—View of Pinacate—A Much-perforated Plain—The First Volcano Crater—A Circus with Prong-Horned Antelopes—My Locoed Coyote—The Malpais Plain—A Bridge to Cross a Ditch—Lost Wagons and Benighted Men—A Bivouac in the Desert—Rescued in Spite of Ourselves—A Long Night Ride.

When we breakfasted at Agua Dulce, nearly an hour before sunrise on the eleventh of November, no one foresaw the length or the breadth of the day that then began to unroll before us. Mr. Milton said to us:

"After we pass the Playa Salada, Charlie Foster can pilot the wagons toward the water-hole where we will camp to-night, and the rest of us can have a hunt for antelope. If you will come with me, I will show you a fine volcano; and then we will join the wagons."

That was our busy day. Looking back upon it, I do not see how anything more could have been crowded into it without bursting it. It was not, however, a day of bloodshed, even though Rube Daniels did open the ball by killing a coyote very soon after we pulled out from Agua Dulce. Knowing that we had more interesting things

ahead, I resolutely declined to be hindered by the skinning of that little gray beast, and so

> "We carved not a line, we raised not a stone,
> But left him alone in his glory.'

Half way between Agua Dulce and the Salt Plain (where the trail swings abruptly north-westward), we came to a high hill of broken granite, naked as any other stone-pile, but bearing high up on its eastward face certain botanical specimens that gave me a distinct thrill. They were organ-pipe cacti, and two of them were twenty feet high! In comparison with those giants, all others that I had seen were small. The prize specimen upreared twenty-two stems, each one from six to seven inches in diameter, and one of the tallest bore a ten-foot branch. But there was not a moment to be spared that morning in photographing plants, and all I could do was to register a solemn vow that I would take them on the return trip.

Incidentally, there perched upon the tip-top of one of the tallest stems of the prize pitaya a fine large hawk, whose existence in that country was a thing to note.

I said to Dr. MacDougal,

"I'm sorry our shot-gun is in the wagon. We need to know about that hawk."

"I'll try a shot at him with my Winchester. Even if I hit him, you can at least identify him."

Dismounting, he secured the best position available, at a distance of about a hundred yards, and fired up the side of the mountain. Down fell the hawk, with the top of its head shot off in the most workmanlike manner

From a photograph by the author.

The Finest Organ-Pipe Cactus

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imaginable. It proved to be Western Red-Tailed Hawk,* with an empty stomach.

The Playa Salada—literally "salty beach"—is what would be called in Montana an alkali flat. It is at the big bend of the trail, three miles below Agua Dulce, and it lies four or five feet above the bed of the river. The plain is a mile long by half a mile in width—level, destitute of grass and white with alkali. Everywhere near this point the river water—when there is any—is so strongly impregnated with alkali that it is a poor beverage for a thirsty human.

At the lower end of the Playa Salada the course of the Sonoyta River is partially revealed. It runs *south* of Pinacate, in a course that is practically south-westward. Later on, we found that it comes to an untimely end against the sand-hills which form an impassable barrier along the Gulf of California, between the lava country and the shore. There is very little vegetation on the northern bank of the river, but on the south there is a wide belt of mesquite jungle.

On November 11th there was water in the river as far down as we could see, but when we returned that way, on the 25th, just fifteen days after the flood, the water ended at the alkali flat. The terminus was a little string of pools, in the largest of which were about two hundred shiny, silver-sided minnows all unconscious of the fate that awaited them—death on dry land. Dr. MacDougal photographed the spot where the last drop of the Sonoyta sank into the sand and disappeared.

**Buteo borealis calurus.*

As previously arranged, we parted company with the wagons at the point where the trail caroms against a string of granite hills that form a very effective barrier running north and south. While the teamsters unhitched and drove their teams to the river to water them, and Charlie Foster took charge as pilot for the day, the mounted members rode straight forward into the rough country.

For an hour we wound to and fro through the granite hills, studying the while their scanty crop of bisnaga cactus, stunted ocatilla, palo verde and mesquite. It was in here that we found for the first time an ocatilla still in bloom, and we examined it with keen interest.

The flowers are pale crimson, tubular, about an inch long, and each throat is filled with a sheaf of red stamens. About one hundred and twenty-five of these flowers are arranged close together on a stalk, forming a raceme about nine inches long. The collection as a whole, as borne on the tip of a green ocatilla wand, is a thing of beauty. How handsome this strange bush must be in May, when it is in full bloom, and many of its stems are thus ornamented!

At last we bore away north-westward, and presently reached the last of the granite ridges. Before us lay the dead volcano we were seeking, while far beyond it, from the centre of five hundred square miles of black lava, rose grim old Pinacate. Forthwith Mr. Phillips and I climbed the ridge to photograph all that we saw.

The view from the elevation we presently attained was very striking. Our ridge was simply a rough stone-pile five hundred feet long and three hundred feet high. In front of it, south-westward, lay a perfectly level stretch of

creosote bushes, as even on top as if trimmed to a fixed height. It did not look so very wide, but when we came to ride across it, it seemed interminable. Beyond it lay a belt of smooth bare ground, and from the farther side of that rose a low, broad hill which seemed to have a flattened top. That was "Cerro Colorado," so Mr. Milton said, otherwise "Red Hill."

We were very anxious to get Pinacate from that point, for it was our first real view of the Mystery. But alas! It was shrouded in that awful blue haze that sometimes delights a painter, but nearly always bursts a photographer's heart. On all save one Pinacate appears only as a mound of fog. Mr. Phillips's best picture is reproduced herewith.

With our binoculars—magnifying instead of reducing—the case was different. In them Pinacate did loom up grandly—a big, black mound of small, blunt peaks and ridges massed together, surrounding and finally building up the two culminating central peaks. The distance to the top of Pinacate's highest peak was twenty-one miles, and its course was due south-west. The blue haze was so impenetrable that we could not tell whether a wagon can be driven to the top of the highest peak, or the mountains are impassable for a led horse. The only thing absolutely certain about it was that in a few days we would stand upon that highest peak and photograph back toward the Cerro Colorado, as far as a lens could carry.

Descending from our labours, we started across the creosote plain. In pursuit of our companions, with our eyes fixed on the volcano, we rode, and rode, until the

plain seemed to be turning forward under us. What I had estimated at three miles turned out to be precisely *seven*. The whole plain was honey-combed with burrows of the kangaroo rat (*Dipodomys*), nearly always made around the clumps of creosote bushes. For about a mile I kept a close watch upon them, and at no time were there fewer than five burrow mounds in sight at the same instant. But not one living specimen did we see. Those little creatures are strictly nocturnal, and no one ever sees one afoot save at night. Mr. J. Alden Loring says that, in all his wanderings as a collector through the haunts of these creatures, he never saw but one alive and uncaught.

At last we did reach the edge of that light-coloured plain; and it proved to be a naked and sterile zone of gray volcanic ashes, half a mile wide and completely encircling the base of what once was a gorgeous volcano. It was as smooth as a floor, and entirely free from bits of lava and stone. Close down upon its surface there grew a thin sprinkling of delicate little plants, almost lichen-like in their growth, known to botanists as the Indian wheat, or desert plantain (*Plantago aristata*, or perhaps *P. ignota*).

That curious plant is as white as if covered with hoar-frost, and lends much extra whiteness to the appearance of the ashy zone. The prong-horned antelope loves to feed upon this delicate white carpet, and of this Mr. Milton was fully aware. It was here that he hoped to find a herd.

Seeing no antelope, we rode across the zone of ashes and straight up the side of the volcano. When we drew

From a photograph by J. M. Phillips

Pinacate, as It Appears from Twenty-one Miles Due North-east

Cerro Colorado is in the center of the picture near the skyline, seven miles distant

rein upon the rim, a gorgeous scene lay before us and the adjectives began to fly like hail.

"Magnificent!" "Grand!" "Vesuvius in the desert!"

At our feet there yawned a vast circular pit, walled in by perpendicular cliffs of red lava rock. It was half a mile in diameter, and about two hundred feet deep on the low side where we were. The rim of the crater was sharp, highest on the south side (opposite us), and lowest on the west, where a notch had been blown out—all precisely like Vesuvius, as it was in 1876, and for several years thereafter. The rim on which we stood consisted of volcanic sand that by heat had been fused into solid sandstone; and deep furrows ran down it, westward, to the point where the bottom of the notch joined the zone of ashes.

Mr. Milton and I left our horses and advanced to the innermost edge of the crater to examine more closely the vegetation growing scantily on the level floor far below. We noted a thin sprinkling of plants and bushes, and one or two tiny giant cacti.

While we were admiring the beautiful Indian-red tone of the walls, Mr. Milton took one more look far westward.

"Look yonder!" he exclaimed, "There they come! Yonder's a bunch of antelope—coming straight this way. Look in the green bushes, just beyond the edge of the bare ground!"

Sure enough, six prong-horns were in sight, and heading straight toward us. Up to that time, Doctor MacDougal never had hunted that species, and it had previously been agreed, between the rest of us, that the first chance at antelope should, without let or hindrance, be his.

"There's your game, Doctor!"

Quickly he stripped off his spurs and belt-gun and made ready for a stalk; and Rube Daniels took charge of him, willy-nilly, being himself as crazy as ever to shoot something. They crouched away down the rim, behind ridges and bushes, to the bottom. From that they worked out into the ash zone itself, by means of a long, straggling line of mesquite bushes that seemed to have been grown there for that occasion. Mr. Phillips followed them at a safe distance, to see the sport by naked eye, but the rest of us stood pat where we were, holding the horses.

The antelopes jauntily walked out upon the ash field and began to feed. As they nibbled they slowly walked straight toward us. The original distance of half a mile narrowed very slowly, and we saw that it was to be a waiting game, with a doubtful finish. After a long and rather tiresome interval the herd had reached within about three hundred yards of the hunters behind the ultimate bush and their rifles rang out. One of the bucks was seen to fall and struggle violently upon the ground.

"They've got one! One's down!" said we.

The other five pranced wildly about, undecided what to do.

We saw Dr. MacDougal rise and start to run forward, then return to his bush.

"Why don't he *go to it?*" said Jeff Milton, impatiently. More firing, shot after shot, in quick succession. Then the unwounded five antelopes divined the source of the alarm, headed due south, and in single file scudded away

like the wind. To our horror the wounded buck then got upon his feet and ran after the herd, on three legs.

"Bang! bangetty-bang!" went the two rifles, cutting the dust far beyond the fleeing quarry; but never another hit. In quick time all the antelopes were out of range; and then Daniels sprang out and like a wild man raced across the plain *on foot*, after them! Finally, Dr. MacDougal followed him. A moment later the game plunged into a thick growth of green bushes far to the south, and disappeared.

This is what happened behind the last green bush:

With his first shot—at very long range—Dr. MacDougal knocked down his buck, with a broken hind leg. Naturally, his impulse was to "go to it" and make sure of it; but when he sprang up and started, Daniels called to him and said,

"Don't go! Don't run out! Stay here and keep on shooting, and I'll get one!"

So the Doctor returned to cover, kept on firing at the running antelopes five hundred yards away; and no one got one.

We, the watchers, collected the horses and spurs, and as quickly as possible rode down and across the plain on the trail of the two hunters. After riding a mile through the chaparral, we came to the edge of a rugged lava plateau about five feet above the desert level, and there Mr. Phillips and I halted while Mr. Sykes and Milton rode on after the runaways, leading their two horses. A little later Mr. Phillips wandered off on foot to a mile-distant ridge, leaving me to make notes and look after three

horses. And then a weird thing happened; part of which I can prove by means of affidavits.

It was mid-day, and the sun had warmed the world up to about 90 degrees. As I stood beside my horse, drinking from my canteen, with the other horses grouped near us, a coyote calmly walked across a bare opening, in plain view, and only *twenty-one paces away!* My rifle was actually under my hand and I could have blown the animal to bits; but somehow he seemed a little out of sorts, and "off colour," physically. He must have said "King's excuse!" when he started my way; for he seemed to care no more for me, or for the horses, than if we had been blocks of wood.

While I was wondering about the state of mind of that erratic coyote, back he paced again, returning over his own trail to the spot whence he came. No promenader ever walked more leisurely than he, and with the outrageous contempt of a drum-major he completely ignored man and horses, save for one contemptuous glance. Leisurely he climbed up the rough edge of the lava-field, forty paces from where I stood, walked off to a mesquite bush about seventy paces distant from me, and calmly lay down in its shade. Afterward I paced all these distances to make sure of my facts.

That locoed coyote lay with his head in my direction, *and looked at me!* I spoke to him, civilly enough; but he made no sign. Then I called, "Hello there!" Although he opened his mouth to pant, he said nothing. I whistled, sang to him, yelled at him, and finally reviled him; but as truly as I live, he moved not, nor showed the slightest

From a photograph by J. M. Phillips

Prong-Horned Antelopes, and Their Feeding-Grounds

Shot by Mr. Phillips on the zone of ashes at Cerro Colorado, November 24th

alarm. He simply went on a-lying under the bush as if there were not a man nor a Savage rifle within a hundred miles of him.

Finding that shouting did not disturb him, I raised my voice to its loudest, and called Mr. Phillips, hoping that he might hear me and come and photograph the beast. If I yelled once at the highest pitch of my voice I did so a dozen or fifteen times; and that locoed coyote never batted an eye. Unfortunately my partner was too far away to hear me.

The coyote remained under that bush for nearly half an hour, and might be there even now but for the return of the whole cavalcade. I tried to stave off the advance until Mr. Phillips could get in his work with his camera, but at last the crowd got on the nerves of *Canis latrans*, and while the exposures of him that Mr. Phillips finally made as he was stealing away do show the animal, they were not wholly successful.

Such were the symptoms of that queer coyote case. Now, what about the diagnosis?

That was the third time that coyotes had put up funny jobs on the undersigned. Two of them concerned coyotes that were very wild and wary *when I was armed*, but instantly became tame, and even confidential, as soon as I took the trail without a shooting-iron! Here, however, was an animal that dared to trust his vitals in my hands when I was fully armed, on the war-path and supposedly eager for coyote blood. Now, I ask, *how* did that crazy beast know that I was a hundred times more deeply interested in his mind than in his pelt? I cannot answer that;

but I do know that he took big chances when he picked a man out of that bloodthirsty crowd as the one before whom he could safely flaunt himself, and take the risk of having his head shot off.

But all this is idle persiflage, and is not to be taken seriously. It only reflects the joking theories of our party on that occasion. To come down to the realities of life, I believe two things: 1. That that particular coyote was sick, and cared nothing for trifling interruptions. 2. That he never before had seen, heard or heard of a human being, and knew not what it was to fear one. In that country no one traps coyotes, very few are poisoned and very few are shot; but for all that, most of the others that we saw on that trip had conscientious scruples against standing still when within two hundred yards of a rifle.

Half an hour after the sick coyote vanished on the lava, the stage was set with a totally different scene. We mounted and as briskly as possible rode northward to reach the spot where we expected to meet the wagons. Quite near the edge of the zone of ashes we saw what seemed to be a level plain of bare, hard ground, three miles by two, and lying directly in our course. As ground to travel over, it looked inviting, and blithely we laid our course to bisect it by a new trail. Such a place is locally called "malpais," or "bad ground"; but lava fields also are designated by that very common term.

When fairly launched upon that barren plain, we found that it consisted of what once was very fine volcanic mud, which flowed down from the gap in the rim of the Cerro Colorado. It was also a flood basin, with a

vengeance, often being under water. It looked like the bed of a dry lake, and at that time its surface was cracked open in every direction to an unknown depth. The earth was very dry and loose, and the network of wide cracks was so annoying to our horses that our progress was slow.

In places the surface of this queer plain was covered with a sprinkling of chunks of brown lava, varying in size from a tea-cup to a coal-scuttle. It looked as if large masses of red-hot lava had exploded in mid-air and rained down upon the plain only last week.

Looking ahead we saw two lines of mesquite bushes crossing this bare plain from west to east, and along with each water gleamed in a ditch-like stream. It was the residuum of the last flood that had covered the plain, and the four strangers from afar welcomed it with the ardour that potable water in a desert always is supposed to inspire. But here we note an exception.

"We can go around the head of this one," said Rube Daniels; and I wondered why we did not go straight across that absurd shoe-string of water. We went around it; but presently we came to another that extended a long mile or more each way, and lay squarely across our course.

"Well, gentlemen," said Jeff Milton at last, "we've got to cross this one, somehow."

"What's wrong with it? Can't we ride across it, anywhere?"

"No, sir! Impossible! If a man should try to ride across that little bit of water his horse would mire down in two seconds, and he couldn't get out again to save his

life without being dragged out with ropes. We've got to *make a bridge before we can get across!*"

I tested the mud in mid-stream. It was like thin mortar and bottomless. And yet that absurd little ditch was nowhere more than ten feet wide and two feet deep! Surely it was a dangerous thing, or those two hardy rustlers would not have ordered the building of a bridge for our crossing.

Fortunately, materials were not lacking. We all fell to work like so many beavers, gathering big chunks of lava and heaving them into the mud and water, to form a causeway. By bending down a mesquite clump, Daniels and I managed to jump across the stream at a narrow point, and work went on from both shores, simultaneously. After about twenty minutes' brisk work the top of the causeway was above the water, and although it was fearfully rough, our horses seemed to understand thoroughly what it meant. One by one we took them by their lariats and led them across, scrambling, stumbling, mud and water flying; but in short order we were all upon the right side with everything to the good.

Milton and Daniels said that we were to meet the wagons and camp close beside two granite mountains that rose very abruptly from the desert four or five miles to the north; and thither we rode. As we neared them the floor of the desert changed to loose sand, and the nearer we came to the mountains the worse became the sand.

"The wagons were to come to this gap between these two mountains; but they're not here, nor anywhere in sight. I hope they haven't broken down again!"

Thus spoke Mr. Milton, cautiously; and we silently wondered how the wagons ever could get in there, and where on earth we would find water, even if they should. It seemed like the driest spot in Sonora.

It was then within about half an hour of sunset and our anxiety grew apace. Bidding the four of us wait where we were, Milton and Daniels rode off northward as fast as possible, to climb upon a lava ridge before sunset and try to locate the wagons.

"If we shoot, that will mean that we have found the wagons and that you are to come to us," said Mr. Milton; to which we agreed.

They quickly disappeared; and after an interval we heard a shot.

"Ah! they've found the wagons!" And we joyously rode forward thinking of camps and comforts of several kinds. Having been in the saddle nearly continuously since sunrise, and without luncheon, we were quite ready both to rest and to eat.

After ploughing through a mile of loose sand under the lee of those two granite mountains, we came to the edge of a great lava bed twenty feet high and terribly rough, and there we found our companions.

"Where are the wagons?" we asked, carelessly.

"*I* don't know!" answered Milton. "We haven't seen hide nor hair of 'em. There's a big misunderstanding somewhere—or else they've broken down."

"But you fired a signal shot."

"That was Rube. He shot a jack-rabbit!"

"*I forgot all about it*, fellers," said Daniels, regretfully.

It was then that the sun set; and the question was, What to do? The wagons might be two miles away, or they might be ten. (They were more than ten!) We might possibly find them in the darkness, but we could easily wander all night and miss them. They might have passed northward of us; and, if so, their trail would be findable, even in the dark, by going north.

"Well, gentlemen," said Jeff Milton resolutely, "I've simply *got* to find those wagons; but there is no use at all in the rest of you going with me. You camp down here and make yourselves as comfortable as you can and Rube and I will ride out north to see if we can't cut the trail of the teams. If we find 'em, we'll come back to you-all."

Thus were we, by one fell stroke, lost and benighted in the desert.

They went immediately, and the Doctor, Mr. Phillips, Mr. Sykes and I at once selected as a camping place a spot where there was a little galleta grass for our tired and hungry horses. Very soon they were free from their saddles, and thankfully grazing. We dragged dry mesquite stems from afar, built a good camp-fire and made ready to spend the night as comfortably as possible. We had one jack-rabbit, and straightway I dressed it with the utmost skill I could put forth. The puzzling thing was to cut the animal into four equal parts, thus making each forequarter as good as a ham. We had no salt, but to encourage my comrades, I cut all the sticks for the broiling act and made each portion fully ready. Each man had to do his own broiling, however, so that in case of any failure the cook to blame would be himself.

I watched with much interest to see how the appetites of my companions would rally to their support in dealing with saltless, amateur-broiled jack-rabbit. Dr. MacDougal and Mr. Sykes did well, but Mr. Phillips's inner man failed to support him as he should have done. His appetite broke down, and although he had a hind-quarter, he negotiated very little of it. Now, *my* appetite —but it is well to draw here the veil of silence.

While I was preparing the jack-rabbit, the Doctor hunted up a small bisnaga cactus of the half-way edible kind, brought it in and carved it. We chewed the pulp and also tried to eat it. The water was all right, but to men who still were under the pamperings of an over-fed civilization the bisnaga was not at that time palatable food. For a man who is very thirsty and desperately hungry it would beyond doubt have been welcome food and drink. This was of the species known as *Echinocactus lecontei.*

With our saddles set up on end, and many green branches to serve as wind-breaks for our heads, and with saddle-pads and boughs on the sand to lie upon, we settled down in our respective places, closely packed side by side, and looked forward to the usual cold night. Until midnight we would not be so badly off; but it was certain that the stinging cold hours after that would see us all crouching over the fire.

We had settled down most peacefully. Our tired muscles had relaxed for the day, and we were dozing our way into slumberland when from the far-off darkness we heard a raucous "Yeep!" Perdition seize the ruthless

interruption! But we loyally answered the call, and by an exchange of cries soon guided to our fireside Mr. Milton and Mr. Daniels. They insisted upon rescuing us; and we didn't like it a bit.

"We found the trail of the wagons! They've gone by, to the north of us," said Milton proudly.

"But where are they *now?*" some one asked, rather spitefully.

"The devil only knows. But we've *got* to find them before morning, in order to start with them when they pull out again, and lose no time!"

There was nothing else to be done. We simply had to permit ourselves to be rescued; but we all felt that it would have been easier to bear the camp that we had than fly to another that we knew not of.

Sadly and reluctantly we saddled our tired horses, stiffly climbed upon them and strung out after our two resolute rescuers. They first rode a long way east, then a long way north; and at last a voice called out cheerily from in front,

"Here it is!"

We swung into the wagon trail, single file, and started on a trot. The tracks of the wheels were almost as plain as railroad irons.

That was, I think, one of the longest rides in the world; for it seemed absolutely endless. At first we were all a bit cross, then indignant, and finally amused. As we reeled off mile after mile and hour after hour, and the pace settled down to a walk, because our tired horses could trot no more, the universal feeling was of grim and hopeless

resignation. When I made shift to look at my watch I found that it was sixteen hours since breakfast and we had already been fourteen hours in the saddle. But, to the honour of our country, no man complained or "kicked" ever so little, even once.

During the last hour I am sure half the members of the party must have slept occasionally as they rode. I kept myself awake by trying to invent an appliance by which a horseman might sleep while riding without falling off; but before it was completed and patented our long, black serpent of men, horses and dust wound off to the left through a lot of scrubby mesquites and our leader gently said to some one,

"Hello, fellers! All asleep?"

It was our lost wagon-camp, beside a tiny little mud-and-water hole, somewhere in the deadly Tule Desert, and *in the United States!* The wagons, as well as ourselves, had made a long, hard pull during that day.

As for ourselves, we had gone seventeen hours between meals, had been fifteen hours in the saddle and had ridden eleven miles since our untimely rescue. And that was only our third day on horseback! But such is Life on the trail and in camp in the far South-west.

CHAPTER XII

THE PANORAMA OF MACDOUGAL PASS AND VOLCANO

In the Tule Desert—Farther than Ever from Pinacate—The Corner of a Vast Volcanic Area—A Weird Cyclorama—Monument No. 180—A River of Verdure—Pathfinding along the Edge of the Lava—A Volcanic Curiosity—A Great Choya Field—The Sand Ridge—A Galleta Meadow—The Doctor's Garden—Fresh Mountain Sheep Tracks—The Papago Tanks, Found in the Dark—Mr. Sykes Finds a Huge Crater—Nature's Planting on the Crater Floor—Two Rifle Shots.

Looking back upon it with a perspective of 3,000 miles, I am tempted to regard MacDougal Pass as one of the wonderful manifestations of our trip. Hundreds of books of travel have been written about far less than was unfolded before us on that memorable twelfth of November and the early hours of the following day. On a narrow green ribbon twenty miles long there were strung a series of Nature jewels of the first water, terminating in a volcano pendant that simply fascinated us all.

The rosy dawn of the morning after our strenuous diversion inspired each member of our party with new life and vigour. We found ourselves encamped in the edge of the Tule Desert, half a mile north of boundary monument No. 180. At sunrise the temperature was 39° F. There was then a little water there, but a week later there was not one drop. Those who come after will do well to put down that spot as waterless.

From a photograph by Dr D. T. MacDougal.

A Desert Botanical Garden in the South End of MacDougal Pass

Dwarfed Giant Cactus; Bigelow's Choya; *Cereus Pringlei* cactus in foreground; Creosote Bushes. The mountains are a part of the author's group. Page 164.

We were *north* of Pinacate, and as far from the central peaks as when we left the Sonoyta!

It was explained that we were hunting a lead by which we could take our wagons as far as possible toward the peaks before leaving them. Our only course was to cut and try—all around the lava field, if necessary—finally halt the wagons at the farthest point we could reach with them, and from there strike into the heart of the rough country by pack-train. As to water, we must carry as much as possible, and within thirty-six hours reach the rumoured tank in the lava country in order to get more.

Mr. Daniels was sure that by swinging around monument No. 180 as if it were a pivot, and striking south close along the western edge of the lava beds, we could take our whole outfit southward for several miles; and that is what we proceeded to do. There was no trail, nor sign of a trail; and it was said that no wagon ever had gone where we proposed to go. Daniels and Mexican Charlie joined their abilities as trail-makers, and during that day they both rendered splendid service. They rode ahead, chose the exact course for the wagons, and shoveled down the sharp edges of arroyas so rapidly that the teams went forward almost without a halt.

When the teams finally got away from our camping-place and started on the swing southward, Mr. Sykes and I rode up on the lava bed to inspect monument No. 180. Our purpose was to introduce ourselves to the personal acquaintance of an iron column; but how trivial was that errand in comparison with the splendid cyclorama that

encircled us! The elevation on which the monument stands is not great, but, like Mercutio's wound, it is enough.

We found ourselves upon the extreme north-western corner of a vast field of lava that stretched southward and south-eastward for miles unknown. There were plains of lava that were nearly level. There were high and rugged pressure ridges—like those of the great arctic ice-pack—and there were cones and hills by the dozen, near by and far away—all bare, black and glowering. Far away toward the south rose, as usual, the great Pinacate pyramid, black and hazy as ever, but with only one peak visible.

Southward along the ragged edge of the lava field ran a thread-like stream of delicate green verdure, a tiny river of fertility flowing far down from—we knew not what. On its western side lay a perfect medley of desert sands, choya gardens and steep granite mountains standing all ways about. North-westward along the Boundary, beyond the Tule Desert floor and its cheerful stand of creosote bushes, rose the scowling mass of the awful Tinajas Altas Mountains, where the water is little and bad, and many a poor traveller has died of thirst and heat. North of us, all along the horizon, ran the high and rugged Papago Mountains—saw-toothed "Sierras" for fair. There is a well and some mines in them somewhere, so 'tis said; but both may go to the de'il together for all o' me.

I fear that I have a weakness; and that it is for international boundaries and monuments. Now, I am yet

From a photograph by D. T. MacDougal

The Edge of the Lava Field, MacDougal Pass

The cactus is a small species of the Barrel Cactus group (*Echinocactus*)

young enough that it gave me a series of electric thrills to know that I was actually standing astride the line that divides two great nations, with one foot in "America" and the other in Mexico. It seems awfully queer to stand at one moment in a far-distant foreign country, and be "at home" the next! It is worth while to be for a time a part of the hard-and-fast line on the map which for forty years has challenged my curiosity and excited my thirst for the Unknown.

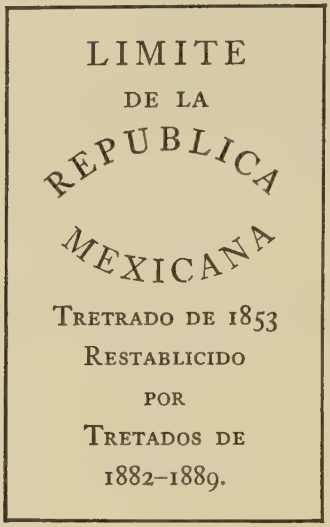
Mr. Sykes and I improved the shining hour by picking up specimen bits of shiny brown lava that lay precisely on the line, half in Mexico and half in America; and by his suggestion I marked the boundary on several, as they lay. While I photographed the monument, Mr. Sykes got into a serious altercation with his fifty-foot steel tape, which soon required his undivided attention. The lid of it came off, and as usual when lids are off, the situation soon became fairly disreputable. No, the Geographer did not use language. He said, very pungently,

"*If I begin*, I'll never get it to rights! If I can just *keep still*, and stick to it, I'll win out—*ultimately*."

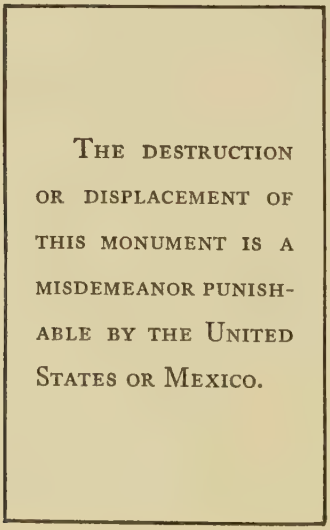
Out of respect for his grief, I said no more; and finally when I was obliged to ride on, I left him sitting there on the lava, silently sticking to it.

Naturally, we examined 180 with keen interest. The boundary exhibits seven or eight different kinds of monuments—cut stone, concrete pyramids and cast-iron pillars. No. 180 is a square, hollow pillar of cast iron, 8 feet high, 11½ inches square at the base by 9 inches at the top. At the base it is bolted very firmly to a foundation of

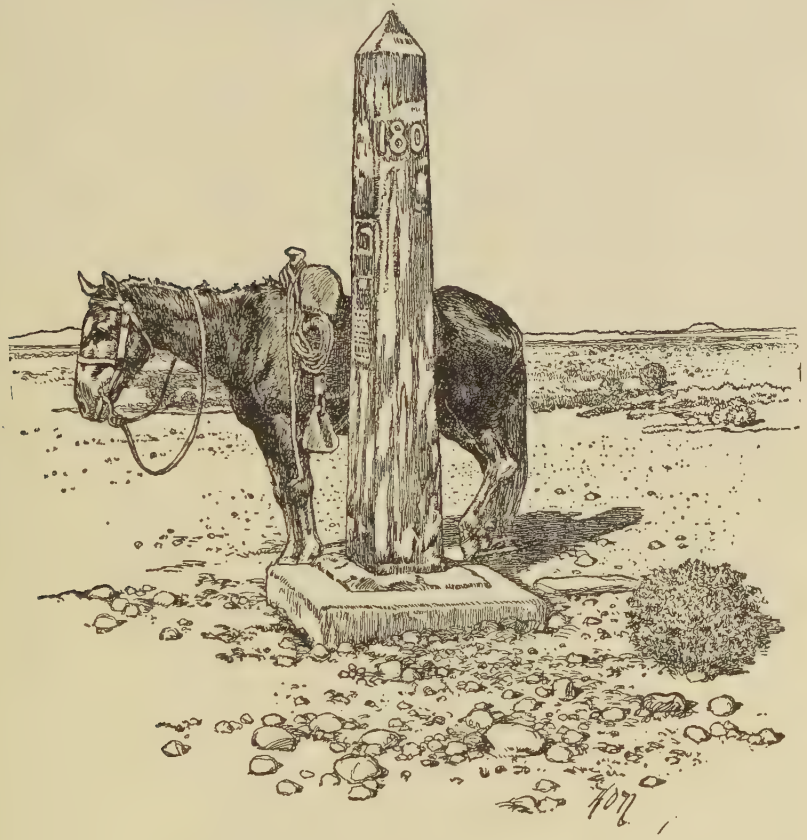
concrete, the top of which is two feet square. On the southern face it bears this inscription:



And on the eastern side it says, in plain English:



If you sin against that monument, pray that you may be caught in the United States; for I am told that in Mexico criminals get their deserts—and possibly a little



Monument 180 on the International Boundary.
Looking north-westward.

more; besides which, even a Mexican jail is something that no prisoner can make light of.

MacDougal Pass begins at monument 180, where the river of fertility flows into the Tule Desert. Its length is to be measured down to the impassable lava at MacDougal

Crater where a little later we left the wagons; and by this fiat, now recorded for the first time, it is fifteen miles long! Its average width, as nearly as I can remember, is about five hundred feet; but in many places it is much less. River-like, it flows between impassable fields of lava on the one hand and of rock and sand on the other; but in all that long distance, *not once* is its course crossed by rock or lava! To me, this seems really remarkable; and so it is. Had that narrow pathway been prepared by the gods of Pinacate especially to help our puny wagons to a point close by the Papago Tanks, it could not have been done any better.

For about three-fourths of its length it slopes toward the north and an arroyo leads down all that distance, with the usual small trees of mesquite, palo verde and iron-wood stringing along its banks. The green edge of the arboreal river stops short at the Vandyke-brown edge of the desert, and the straightness of all these north-and-south lines is one of the things at which to wonder. The lava plain on the eastern side is higher by several feet than the Pass, and upon it, like so many botanical exhibits on a broad bench, stand specimen ocatillas, small nigger-head cacti, torotes, an occasional choya and stunted, scattering bushes of several sorts.

But it is on the western side of the green pass river that the most queer things are found. Several miles up from the Tule Desert, a colossal curiosity looms aloft. It is the eastern end of a short granite mountain, about one thousand feet high (as a guess), which once upon a time opened up a crater on its summit, from which much

From a photograph by D. T. MacDougal

Near View of a Tree Choya and Creosote Bush

lava was discharged. We know this because a great mass of black lava, like a skull-cap, has been built up fifty feet high on the top of the granite mountain, and from the same source more lava flowed down through a notch on the southern side. Clearly, the granite hill-top is a victim of misplaced confidence; for had those internal ructions gone on a little longer, the whole of the original structure which kindly offered an accommodating outlet for the fires below would have been completely buried under the lava flow. I fancy that students of volcanoes may look far before the like of that will be found elsewhere. The black and funereal lava resting on the clean, gray-granite peak is indeed a strange geological exhibit; and Mr. Sykes has christened it Black-Cap Hill.

Not far beyond that bit of history, and on the western side of the Pass, we came to a bare and smooth plain, beyond which stood the most unmitigated choya field that we saw on the whole trip. A forty-acre tract was thickly covered with sturdy specimens of the tree choya,* to the exclusion of everything else. The plants grew as tall as a man, and they stood so thickly that we could not walk through the nursery. It is useless to try to say "That reminds me"—for it reminds me of nothing under the sun. I know of nothing else in nature that looks like it. I essayed to take a record picture of it, but with indifferent success.

Late in the afternoon we came to the crest of the watershed that cuts across MacDougal Pass about ten miles south of monument 180. It is a well-defined ridge

**Opuntia fulgida.*

formed by westerly winds, laden with loose sand from the Gulf. As the sand-bearing winds encounter there a counter current of warm air flowing from the Tule Desert up the Pass, the sand is abruptly halted and piled up, on the *south-western* slope of the ridge. For half a mile men, horses and wagons simply wallow through the loose mass; and lucky it was for us that there were not miles of such going as that is!

Once across that awful Sand Ridge, we found ourselves upon the floor of an amphitheatre, fairly encircled on 180 points of the compass by granite mountains—some near and some far away. Directly on our southward course there rose two isolated groups of noble proportions, perhaps five miles in circumference, and rising very steeply to a maximum height of about 800 feet. The eastern side of the most easterly group rises only 500 feet from the edge of the lava.

A mile north of those mountains—nameless then, but since that day by the Doctor and Mr. Sykes formally christened Hornaday Mountains—there lies a fine meadow of galleta grass, of wide extent. In Spanish the word "galleta" is pronounced "guy-a'ta," and it means "hard-tack"—the fearfully stone-like crackers that are in vogue in army circles in war times. The "hard-tack" grass is a tough species of bunch-grass.

Over a hundred acres or more the clumps of tall, coarse, gray stems held undisputed sway, untouched by cattle, horse or burro. At a few paces distance, the clumps of grass looked woody, dry and dead; but a closer inspection revealed bright green blades at intervals along

the stems. This grass is the great stand-by of the horse in the desert—whenever it can be found. I think it is neither so woody nor so tough as it looks, for our horses always ate it most thankfully.

Just beyond the Galleta Meadow, in the narrow gap between the two groups of mountains mentioned above, Dr. MacDougal discovered a wonderful desert botanical garden, and obtained of it a fine photograph. It is a most characteristic bit of south-western desert scenery—tree choyas, Bigelow choyas, giant cacti of dwarfed stature, creosote bushes, cat-claw acacias and the usual allotment of palo verde and mesquite. Behind the level ground rises an appropriate setting of stage mountains (all mine!), precisely like a scene in a first-class theatre.

A short half mile beyond MacDougal's Garden we halted and went into camp, close beside the foot of my most easterly mountain, but *as far as ever from Pinacate!* A few minutes later I found within a stone's throw of our camp-fire a fine bunch of tracks of *mountain sheep!* Among those present there was a set which could have been made by nothing else than a large ram.

With a warning to everybody to make no unnecessary noise, and on no account to fire a gun at anything smaller than a sheep, Dr. MacDougal and I quickly caught up our rifles and hurried off into the gap between the two nearby ranges. We hunted diligently until sunset, and although we saw no sheep we returned to camp feeling reasonably certain of a shot on the morrow.

Mr. Phillips found in the Galleta Meadow an extra-fine jack-rabbit which he greatly desired to possess, but

knowing the desirability of not alarming any sheep by a gunshot, he laboriously followed up that jack and killed it with a feeble little "pop" from his 22-calibre pistol. Until darkness fell, many eager glances were cast upon the visible faces of those mountains for sheep. Once I was sure that I saw one, and saw it move; but it turned out to be a trick of the fast-vanishing light, turned for a brief moment on a white Bigelow choya and then withdrawn. I thought it was the white rump-patch of a sheep.

That camp was a dry one, and we had no water for those seventeen horses. Charlie Foster, Mr. Milton and Mr. Daniels compared notes and decided that we must be sufficiently near the Papago Tanks that by men on horseback they might be reached in an hour or two. They decided to take all the horses and "make a try" for it; which they did. They rode off south-eastward across the lava-beds, on what seemed to me like a hopeless experiment. For myself, I was so dead tired that such a ride at that hour would have been a great task; but those three desert-wallahs seemed to take it wholly as a matter of course.

They were gone about three hours, and returned at late bed-time, when the rest of us were stretched in our sleeping-bags, tired but triumphant. They had actually found the Papago Tanks; the tanks contained an abundance of good water, and the horses were serenely happy. The tanks were about five miles away, but—thank goodness!—directly toward Pinacate.

For the morrow we planned two important things. In one way or another, we would get the outfit to the tanks,

From a photograph by J. M. Phillips.

The Outfit Coming Through MacDougal Pass

Within two miles of MacDougal Crater, looking north.
Hornaday Mountains close by on the left.

and at the same time three of us would have a hunt for sheep in those near-by mountains, starting just as soon as the teams were well on their way. Once more every one was cautioned that because we were then in the haunts of big game, there must be no shooting at small game, nor unnecessary shooting of any kind.

The morning after our night in the neck of MacDougal Pass dawned gloriously across the dark-brown lava landscape and found every member of the party keenly expectant of interesting events. The morning temperature was 42 degrees and the humidity 80 degrees. It was a great relief that *at last* we were to cease swinging around Pinacate, at a radius of about fifteen miles, and go directly toward it. As we pulled through what proved to be the last mile of the Pass, Mr. Phillips climbed upon a high point and secured a fine picture of the Pass and the outfit coming through it. Mr. Milton was absent, on a short side hunt for antelope, but otherwise the party was complete, and at its maximum strength. The reader will note from the picture that the giant cactus still welcomes us, but its stems are small, short and without branches. The ocatilla was there in fine stature—in fact, at its maximum height, as we saw it on that tour.

No sooner had we emerged from the southern end of the Pass and scattered toward our several ways than Mr. Sykes suddenly appeared, riding rapidly toward Dr. MacDougal, Mr. Phillips and me, waving and shouting.

"Come up this way!" he cried. "*There's a huge crater*, just at the top of this ridge! *It's grand!*" And back he went again, as fast as he could go.

We quickly turned and followed the Geographer up a brown slope covered with small pieces of lava, toward the crest of what seemed to be a ridge. On reaching its summit, like a picture thrown upon a screen an immense crater suddenly yawned at our feet! Its rim was almost a perfect circle, two miles in circumference, and its top was nearly level. Its diameter at the top was about three-fourths of a mile.

Far below, a floor almost as level as a lake spread across the abyss. Its surface was of clean yellow sand, but a dark area in the centre looked like moisture that had settled there during a recent rain. Evidently the sand that covered the floor had blown in from the near-by sand-hills of the Gulf littoral.

That crater floor was most strangely planted. It was fascinating to see, with such clearness of detail, how Nature had gone about her work. Each item of the planting was so separate and distinct that with the aid of a moderately good glass one could have counted the individual plants, even from the rim. In places *the things were growing in rows*, radiating from the centre outward; and I particularly call upon the long lines of creosote bushes in the southern end of the crater to bear witness to the truth of what I say. I think this has been brought about by the wash of storm water from the steep sides of the crater, flowing toward the central area.

The sandy floor was stippled all over with tiny creosote bushes—like dark-coloured dots on pale-buff blotting-paper, very far apart. This, evidently, is the most persistent and hardy Pioneer of the Sand. The mesquite

bushes had climbed down the walls of the crater, from every direction, and had marched about one-third of the distance out toward the centre. By and by, say in twenty-five years from now, they will meet in the centre. The eye easily picks them out, by their greater height and larger mass than the creosote.

The oddest thing, however, was the invasion of the saguaro, or giant cactus. Evidently its advance-guard had found it impossible to climb down the steep walls, but at the south-eastern side of the crater they found a deep notch, and through that breach they were swarming in. About fifty of them had "made good" by getting down upon the crater floor, and they were marching forward in irregular open order to capture the place. A few skirmishers had ventured out fully half way to the centre, but the main body was back near the breach in the wall, as if to keep in touch with the one line of retreat. There was not one saguaro anywhere else on the crater floor. The invaders were just like so many soldiers in light fighting order—small, straight and limbless.

Mr. Sykes lost not a moment in climbing down to the floor of the crater, taking its altitude and measuring its diameter, by pedometer. He reported it as being about 400 feet in depth below the rim, 50 feet above sea level, and 1,200 yards in diameter on the bottom. As he paced across the floor, he looked like the terminal third of a pin, and it was with much difficulty that the unaided eye could pick him out. On the bottom he saw a jack-rabbit, several doves and a small rodent.

This crater was not so very deep, and its sloping walls

were in many places quite practicable for a good climber. There are many craters that are larger than this, and in comparison with such gigantic manifestations as Kilauea or Mauna Loa in Hawaii, this is a mere saucepan. For all that, however, as desert craters go, it is a big one, and the perfection of its modelling is thoroughly satisfactory. It is all there, and excepting its floor it is exactly as it was when the last ton of lava was thrown out, and the fire under the boiler was permitted to go out because there was no more work for it to do. In all probability there is plenty of lava buried under the sands on the western side of the crater that have blown up from the Gulf, but at present the only visible work of this crater, of any decided importance, is the lava field toward the east, which boiled out through the notch and flowed toward Pinacate for two miles or more.

That crater was the leading sensation of the day—but not the only one. When the teams arrived opposite the point of view, the men leaped from the wagons and fled up the lava-covered slope to the sky-line, for a share of the wonder. At imminent risk to the safety of "Bill" and "Maude," the whole party of men and dogs strung itself along the rim, vainly striving to absorb into their systems an adequate impression of the wonderful scene. Early in the game three photographers went to work. Of course, no camera could take in the entire crater on one plate, nor even the half of it; so each of the two real photographers made a three-section panorama. Their pictures are very good, especially when put together in a strip two feet long; but when an effort is made to reduce all that down to the

From a photograph by J. M. Phillips

MacDougal Crater, from the South-east

The sand dunes rise into view in the middle distance, around the half-buried granite butte on the left

length of a book illustration, the grandeur of it goes all to pieces, and the reduction is a tame spectacle.

It was while we were admiring the crater at the rate of twenty interjections per minute, and the camera men were working their hardest, that we were startled by two thundering reports coming from the notch, just out of our sight, southward. As the roar of the shots rose on the still air, resounded through the crater and undoubtedly travelled far beyond, we all looked at each other in blank astonishment.

"Who was that?"

"It must be Daniels and Charlie."

"They must have found some sheep in that notch!"

So they had; but not as we thought; and the sequel was one of the most exciting and painful episodes of the trip.

CHAPTER XIII

THE PAPAGO TANKS AND THE LAVA FIELDS

An Unpleasant Episode at MacDougal Crater—Mr. Daniels Leaves Us—By Pack-Train Across the Lava—The Papago Tanks—Aqueducts Through the Lava—Our Little Oasis—The White Brittle Bush—Vegetable Life on the Lava.

For some reasons I would be glad to leave out of my story the next incident; but the man who puts his hand to the plough to run a furrow of narrative into a wild and unknown country has no other option than to be a faithful historian. My hunting trips always have been so free from painful incidents that the one at MacDougal Crater was very much of a novelty.

At the eastern foot of the MacDougal Volcano, where the wagons halted while the drivers ran up to see the sight, the lava imposed a barrier squarely across our course —impassable for wheels. There the wagons were elected to remain until we were ready to take the trail homeward. From that point onward our progress must needs be by pack-horses; and it was three and one-half miles to the tanks.

Quite near to the rearmost wagon stood a grand ocatilla in full leaf, of seventy-two stems, and eighteen feet in height; and while the clan was gathering from the crater I essayed to make a photograph of the Finest. One by

one the members of the party came down, and finally came the Doctor.

Some of us had heard the news that Daniels and Charlie had seen five mountain sheep run up out of the crater, and pending further inquiry we concluded that the two shots fired had been at those animals. But Dr. MacDougal had also heard something else. As he rode close up to the group around the wagons and reined up his horse, he said to Daniels,

"You and Charlie saw some sheep, didn't you?"

"Yes," answered Mr. Daniels, "we saw five."

"Where were they?"

"They ran up out of the crater."

"And you missed them?"

"No, we didn't shoot at them. They were too far away."

"But you fired twice. What *did* you shoot at?"

"Oh, I just shot at some rocks over there," answered Daniels, as if bored by the question.

Then the Doctor said, quite calmly,

"You know, Mr. Daniels, that it was agreed between us all that when we reached big-game country there should be no shooting around camp, and no unnecessary shooting of any kind."

"Well," answered Daniels with defiant insolence, "for one, I'm *agoin' to shoot at anything I please—any time!*"

His words went through me like electricity, and my interest in the photography of ocatillas suddenly ceased. The overt act, and the deliberate defiance of us all, were both outrageous. But it was not necessary for any third

party to say aught just then, for the Doctor gave no one an opportunity. Instantly he boiled over.

"Now, then," said he, white with anger, "there is one thing that we are going to settle, right here, once and for all. It has been thoroughly understood that there should be no unnecessary shooting in big-game country, and I'll be d—d if any man in this party shall be allowed to spoil the sport of everybody else and thwart one of the objects of this expedition. There are two gentlemen here who have come a mighty long way to see this country and have a little shooting, and they're going to have what they came here for, or I'll know the reason why."

Now, no man who ever has crossed the Plains needs to be told that such a declaration of war, addressed to a strange man on the off-side of the Boundary, who always carries a loaded six-shooter and very seldom smiles, is a very chancy proceeding; and when that man is passionately desirous of shooting everything in sight, the uncertainty of the result is intensified.

It was at this juncture that Mr. Phillips rode up to the outer edge of the group. Long before the Doctor had finished what he had to say I joined the inner circle, and having chanced to stand quite near Mr. Daniels, my opportunity to note his movements was as good as could be desired. At first his face flushed a deep, angry red, then went pale and cold. He began to untie, and tie anew, the leather thong that held the muzzle of his big six-shooter in place against his thigh; and I thought it a strange moment to be adjusting a loaded revolver. As the Doctor finished he said,

"Well, I'll pull out in the mornin'."

Then he went on tying down the muzzle of his gun, as if he feared that otherwise it might get away from him; and I watched him, fascinated.

Mr. Milton struck in with a strong protest, and among other things he said that he had invited Mr. Daniels to come as his guest, and that if his friend felt obliged to leave he (Milton) would have to go with him—much as he might regret the necessity for doing so.

And then Charlie Foster—our hired man—got up on his hind legs and said,

"If Mill-ton go, *I* go!"

Then some of the rest of us expressed our views, in which Dr. MacDougal, Mr. Phillips and I were a unit. We all said,

"This is a plain business proposition. Three of us have come here to study the country and its animals and do a little shooting. If everybody else is going to shoot all over the country, at all times, in defiance of our wishes, and defeat the objects of the trip, we may as well turn around here and go home. But we don't propose to do that. No man save Dr. MacDougal is indispensable to this party. If Mr. Daniels is willing to live up to the necessary rules of the game, we shall be glad to have him stay with us; for we appreciate what he has done for us up to this point. But, if there is any man in the party who doesn't care to play the game according to the rules, we shall have to get along without him. No man need stay a moment on our account, for we are abundantly able to go on, do all that we came to do, and get out again, all right."

Mr. Milton did his best to mollify his friend, and induce him to change his mind, although strongly protesting all the while that the Doctor had been "too severe"; but Daniels' only reply was,

"You can do as you like, but I tell you *I'm agoin'*—in the morning."

"Well," said Jeff, reluctantly, "if you go, I'll have to go with you; but it's too bad to divide the outfit."

That expression—"divide the outfit"—roused the Doctor afresh. He said,

"If this outfit is to be divided at all, it's going to be divided *to-day*, and *right now!* There's nothing to be gained by postponing it. We'll give you an outfit of provisions; and Jeff, here's the remainder of the ammunition that I brought for you."

The Doctor went to one of his boxes and pulled out a bag containing at least a peck of cartridges in the original packages, which he emptied upon a blanket at Mr. Milton's feet. Daniels immediately went to work to "cut out" his blankets and clothing, and make up a pack for his spare horse. He was offered provisions, but to the last he sullenly refused to accept anything. Very soon he mounted and rode away eastward across the lava, leading his pack-horse.

For a time we were much depressed by this incident; but, as the French say in such cases—*qui voulez vous?* What will you have? A man who refuses to abide by the rules of a game simply cannot sit in it.

Of course there was much conversation not recorded above. We were profoundly sorry—and said so—at being

compelled to lay down the law to a man who had served us as faithfully as did Mr. Daniels on the previous day; but we had come too far to have the trip spoiled by the foolishness of any one man. We were quite certain that with our original Tucson party the trip could be carried out according to programme, successfully, and we were ready to say good-by to the whole Sonoyta contingent, if need be.

I am glad to say that Mr. Milton reconsidered his first decision—that he was in honour bound to follow the lead of Daniels. I think he must have recognized the justice of our position, for he remained with us. After the departure of Daniels, we never again discussed the incident, or even mentioned it. He remained with us to the end, did absolutely everything in his power to contribute to the pleasures and successes of the trip, and we enjoyed his company very greatly.

On the day that we reached the Ajo Mines on our way out to Gila Bend, whom should we meet at "the store" but Mr. Daniels! He was on his way down with a load of "outfit," for himself, and was about to begin some contract work on a mining claim. He had no use for me, or for Dr. MacDougal, but was friendly toward Mr. Phillips, even to the extent of standing (with John's rifle) for a photograph against a near-by palo verde.

MacDougal Pass ends at MacDougal Crater, and there all heavy wagon travel stops. It might be possible for an empty buck-board to wind its way two or three miles farther, across the least-rough lava plains, or even with some work to reach to Papago Tanks; but I advise

any one who thinks of attempting it first to make a practicable road across the lava gulches and arroyos.

We abandoned our wagons at the Crater, and our horses were immediately packed with as much of our impedimenta as they could carry. It is quite a chore to overhaul a wagon-load of miscellaneous freight, in all sorts of receptacles, assort it for carriage by horse, and make it up into packs that will ride without slipping and without injury to the back of the party of the first part. But Frank Coles is a genuine expert in packing, and with the skilled assistance of Jess Jenkins, Jeff Milton and Charlie Foster, the work was soon accomplished, and the long line of horses began to wind its sinuous way over the lava field.

It gave us queer sensations—to strike off straight toward the centre of that great black expanse, the crater and the awful Sand-Hills behind us, dead volcano cones and peaks on both sides of us and all kinds of lava underfoot. Ahead of us was roughness, ruggedness, low lava cones and high ones—brown, red and innumerable, finally culminating in Pinacate itself. All we knew of the country ahead of us was that it was *all lava*, mostly very rough, and Pinacate was "as far away as ever!"

The trail of three and one-half miles over to the tanks proved to be not so very bad. There were stretches of fairly level plain whereon the footing was smooth enough to be really good, and the lava sprinkled over the surface was in such small bits that no one minded it.

Without knowing it on that first day, we passed quite near another big crater, and also two massive dead vol-

From a photograph by D. T. MacDougal

The Papago Tanks

The setting is wholly of shiny lava rock, almost as hard as flint. The bushes are stunted mesquites. Two pygmy giant cacti appear on the left

cano cones; but there were no terrible tracts of pressure-ridge lava such as we found in scores of places farther along. Our route to the tanks was garnished with ocatillas, bisnaga cacti, the inevitable choya of Bigelow, and an occasional *Encelia* and dragon's blood; of which, more anon.

The impression made by the sight of a new thing in Nature is wholly dependent upon the observer's frame of mind. It is always a great pity for a traveller to see any new thing of paramount interest when he is too hot, too cold, too wet or too dry to enjoy it. The human mind is like a photographer's negative. If the emulsion is not too old and stale, if there is not too much halation, too much smoke of cigarettes or mental fog, the image will be sharp and clear, and appreciated.

I think that of our party, every man, horse and dog fully appreciated and admired the Papago Tanks. How I wish I could interview "Maude" and "Bill" to-day—the leading mules of our stock company—and have them tell me whether they remember the sweet, clear water of that big pool, and the gloomy walls of lava rock that surround it. If it were possible to know, I would willingly wager that they do remember it, perfectly, and if lost in MacDougal Pass could find it again.

I envy those travellers and writers to whom every manifestation of Nature is like an open book with a drop-light over it. Would that I had been born a geologist of the kind to whom all things are known; especially the Dim Past! Could we have borrowed one for our trip, how useful he would have been on those lava beds! But

now it is too late; and I fear I never will know how those deep water-courses were cut down into that flinty lava rock, and how those Papago Tanks were blasted out of seamless basalt harder than hematite. If any one says "erosion," or "the action of water," you may say—"Nonsense!" In such flinty rock as that which bounds the Papago Tanks, a three-inch rainfall could not scoop out a four-foot basin in a million years. That rock is as smooth as a plate of steel armor, and almost as hard. It glistens like vitrified brick.

Volcano cones, deep craters and lava flows are not so very mysterious; but those deep, ditch-like arroyos cut through flinty lava certainly puzzled the undersigned. There are dozens of them—ay, scores of them. They head far up toward Pinacate, and in the first five hundred feet from their parent mountain-side, down they go into the lava, ten feet, or twenty feet, just like so many open subways blasted out of solid rock. In trying to cross an innocent-looking lava plain you suddenly fetch up on the brink of one of those strangest-of-all water-courses. It may easily be thirty feet deep, with walls absolutely perpendicular; and you may have to hunt up or down for a quarter of a mile before you find a way to scramble down to the bottom. The walls and bottom are of bare rock, clean and spotless, and wherever you find a pool of water, be it a cupful or a hundred barrels, it will be crystal clear and sweet as a mountain spring.

No; those huge stone aqueducts were *not* made "by the action of water!" My word for it! In a country wherein the average annual rainfall must be about three

inches, storm water could not excavate one of those rock arroyos in a decillion of years; and from the story of the lava and the craters, we know that the time limit of that land does not reach back that far, by at least a billion.

The Papago Tanks are great. As Napoleon once was said to be, they really are "grand, gloomy and peculiar." Of course they are situated in one of those stone-aqueduct arroyos which comes down three or four miles from the Pinacate Mountains. Out of the lower side of a burnished wall of smooth, bluish basalt at least twenty feet high, there has been scooped a deep niche, and the floor of it has been deepened to four feet, to make a basin. On the western side there is a nice little beach of sand and gravel, and back of that huge boulders of basaltic lava have been piled up promiscuously. It was in the pool which lies in the bottom of that rock-rimmed basin that we watered our stock—and I wish you could have seen them there on that first day! They drank, and sighed contentedly; they tossed the water with their muzzles, then they pawed it until it flew all over us. My black horse *presently lay down in it*, and took a bath!

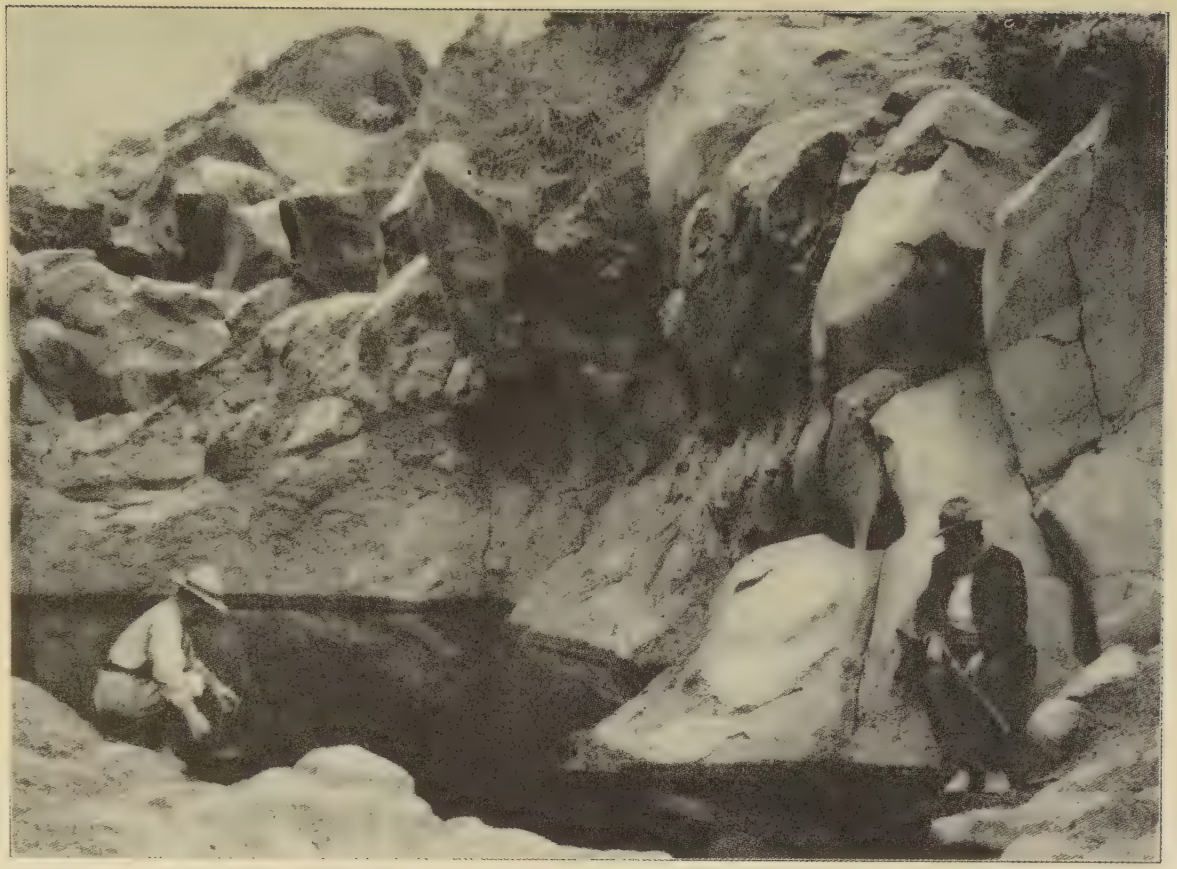
The surprise of those horses in finding such a body of water in that lava-bed was literally overwhelming; and how they did enjoy it!

Back of the large pool—which was dedicated to the horses of the outfit—another basin has been carved out, for another pool, but much smaller. It looks like a big black cistern with a piece bitten out of one side. As I remember, it is about twelve feet in diameter and twenty feet high, and the pool occupies practically the entire bottom.

Upon the ragged lava above, the vegetation of the desert has bravely established holdings, and the nakedness of the burned-out mass is relieved here and there by pale-green splashes of mesquite. Like sentinels guarding the precious liquid down below, two stunted but persistent saguaros stand on the bare lava that forms the westerly rim of the tanks.

There is a third tank, of good size, that lies on a still lower level, amid a chaos of loose boulders; and being the nearest to our camp, our cooks drew upon it for our daily supply. In all three of the pools the water was delicious, and at the time of our entry contained no algæ. Later on, however, the level of the Horse Pool lowered considerably and a mass of green algæ formed over half of its surface. All these pools contained many specimens of a small species of crustacean, belonging to the genus *Apus*. They were only an inch in length, rather soft for crustaceans, and in colour dull, lustreless gray. We also found specimens of a cosmopolitan species of water-beetle,—*Eretes sticticus*,—that is found all the way from Japan across country to Peru. The only other life in the tanks consisted of larvæ of the dragon-fly, gorgeously coloured purple, scarlet, yellow and green. These were quite abundant.

It is to be remembered that we found this abundance of good water in the Papago Tanks at the *end* of an unusually wet "rainy season." Travellers who visit them in a dry year, or in spring or summer, are liable to find them *totally dry;* in which case the result may easily become very serious. If the pools are dry, the nearest water will



From a photograph by J. M. Phillips

Details of the Lava Wall of the Upper Tank

be in the Represa Tank, twenty-five miles away in an air line on the Camino del Diablo, or, worse still, in the Sonoyta River—goodness knows how far away—fifty or sixty long, hot miles. Therefore do I say to those who may come after us—do not rashly attempt to negotiate the Papago Tanks without knowing precisely how you are going to "save your bacon"* in the event that you find them dry.

The lower environs of the Papago Tanks are in reality an oasis—small, but of paramount value. The lower pool marks the upper end of an arroyo, or barranca, of great importance to this region, for its vegetation furnishes an abundance of shade, grass and fire-wood. The stream-bed of loose sand varies in width from one hundred feet to two hundred, and the little ribbon of level valley through which it runs is a perfect jungle of big mesquite and palo verde trees, ironwood, desert willows and smaller things. There was an abundance of galleta grass for our horses, without which the place would have been actually untenable. "*Luck?*" It certainly was. This arroyo runs westward clear down to the edge of the sand-hills, ten or twelve miles at least, but below the Papago Tanks it is waterless save in times of flood.

We camped on a lovely little plaza, at the northern edge of the oasis, facing a horribly rough hill of lava. It was a very bad quarter of a mile to the Horse Pool. Up on the lava hill north of our plaza we found two large piles

*This classic exhortation, from the ball-grounds of the western school-boy, is particularly useful in the south-western deserts, and might well be pasted in every traveller's hat.

of stones, placed there by Papago Indians, and near them a pile of eighteen badly charred horns of mountain-sheep rams that had been butchered to make a Papago holiday. This spot lies on what once was the route taken by the Indians of the Sonoyta valley to reach the saline deposits of the Gulf of California on their annual journeys for supplies of salt. Had those trips continued a little longer the mountain sheep of Pinacate surely would have been exterminated by the Bean-Eaters, root and branch.

Naturally, we were greatly interested in the vegetation around the Tanks. There we found, in its prime, a beautiful white-leafed bush called *Encelia farinosa*, but apparently in need of a good English name. To supply this absurd omission, we will hereafter call it the White Brittle-Bush.

The White Brittle-Bush, as seen standing alone on bare black lava, is truly a thing of beauty. It is hemispherical, symmetrical, immaculate and clean as a new shirt. It is like a big white bouquet. Its leaves are *all on the outside*, and although its branches are large and stocky—for the storage of water—they are so brittle that you can grasp a great handful of the outer stems and, with one movement, snap off every one of them as if they were so many pipe-stems of clay. The leaves are very large—for a *desert plant*—the blade being shaped like a broad arrow-head, one and one-half inches long by one and one-quarter wide. The flower is a little yellow composite, like a tiny yellow daisy, thrust far up on the tip of a frail and friable little flower-stalk six inches higher than the periphery of the foliage. We found few of them in flower,

From a photograph by D. T. MacDougal

The Spiny Smoke Tree

From a photograph by D. T. MacDougal

The White Brittle-Bush

but enough for our inquisitive purpose. To the taste, the foliage is strongly aromatic, pungent and bitter, and recalls the foliage of the common sage-brush (*Artemisia*). Apparently no animal eats the stems or foliage of the White Brittle-Bush; and we are very glad of it, for it is truly a soft and pleasing thing to contemplate on the scowling lava-fields. The mountain sheep doubtless shared our views, since nearly every one killed was found to have browsed amply on the slender, delicate dead flower-stalks of the last season that still adhered to the stems, and projected above the grayish-green mass. This bush is said to be widespread in the south-western desert, but I did not notice it anywhere outside that Pinacate-Sonoyta region; which may have been my fault.

Naturally, in such a wild and weird spot as the Pinacate region, every plant, tree and living creature is of interest—rendered so by the grim surroundings and the intensity of the struggle to survive. It is fair to assume that the plant life we saw at the Papago Tanks represents only the boldest and hardiest species of the south-western desert region; because, were they otherwise, they assuredly would not be there. I am therefore tempted to mention a few more of the plant species that grew in the little valley that ran through the lava waste like a green ribbon trailing through a cinder-bed.

I have already mentioned the Iron-Wood Tree.* In size and general appearance it strongly resembles both the mesquite and the acacia—all of which have tiny leaves and look very much alike. Its wood is intensely hard and

**Olneya tesota.*

solid, in which it goes to the opposite extreme from the numerous bushes with big, soft, pithy stems that have been specially developed for the quick absorption and storage of large quantities of water.

Quite near our camp were several Spiny Smoke-Trees, or Indigo Trees (*Parosela spinosa*), one of which was the largest and finest specimen I ever saw growing wild and untrammelled. Dr. MacDougal made of it a very fine photograph. The peculiar fluffiness of its foliage and its green-gray colour render it conspicuous from afar, and instantly recognizable.

The giant cactus had indeed gained a foothold on the lava, but on account of the scarcity of water and the total lack of soil, the straggling specimens of it were very small and limbless. The organ-pipe cactus was quite absent from the lava, and so was the large barrel cactus.

In that land, it is safe to guess that any shrub which is not protected by thorns is defended by a bitter taste. The big-stemmed, small-leafed bush called "torote prieto" is almost as bitter to the taste as quassia, and is rarely eaten. But it is no wonder that any plant growing on naked lava should be bitter. Any struggle for existence that is too fierce to be interesting is apt to embitter the party of the first part.

The banks of the arroyo near our camp were a dense jungle, in places almost impenetrable. There were great patches of a tall, rank weed, with large leaves, much resembling the iron-weed of my boyhood days. Over the tangle there sometimes ran a dark-green vine, with fine tendrils (*Echinopepon wrighti*), that much resembles our

wild morning-glory. As usual, we depended upon the old reliable mesquite for the camp-fire, and it never failed us.

Of course there were several species of cacti on the lava, mostly small bisnagas and choyas, but they will be spoken of later on in the cactus chapter.

As soon as our pack-train had been unloaded at the Papago Tanks, the Doctor's tent was put up to shelter our belongings from dust, and we established ourselves in what might be called a "permanent camp." It was a wonderfully weird spot, and no sooner were we settled in it than things began to happen.

CHAPTER XIV

EXTINCT VOLCANOES AND MOUNTAIN SHEEP

A Blank Sheep Hunt to the Author's Mountains—Mr. Milton Scores with Two Sheep—Mr. Phillips Kills Two Rams—The Clover-leaf Crater—The Sykes Crater—Awful Lava Cones—The Dead Ram and Its Surroundings—Mr. Phillips tells the Story of the Rainbow Rams.

The fifteenth of November was one of the great days of the trip; but for once my luck abandoned me, and in the thrilling events I was not among those present.

Three hunting parties went out for mountain sheep. Mr. Milton went north-east, Mr. Phillips, Mr. Sykes and Charlie Foster went north, while Dr. MacDougal and I went back to try out the granite mountains west of the southern end of the Pass—beside which we had camped and found fresh sheep signs.

Like the luckless whaler of New Bedford, the Botanist and I got no sheep, "but we had a mighty fine sail." We circled around the big crater, close under its rim, but found no sheep within. We combed all those mountain sides, as with a fine-toothed comb. We climbed high up into the heart of the southern group of mountains, where by good rights there should have been a dozen big rams, but found no sheep.

At noon we unsaddled at the extreme western foot of

From a photograph by D. T. MacDougal

Our Camp in the Oasis below the Papago Tanks

the range in the edge of the sand-hills, and while our horses restfully cropped the galleta grass we studied the botany of the sands. Lying low on a dune, we saw precisely how the light, dry sand steadily and persistently travels eastward, close along the surface of the fixed deposit, a thin sheet of it rolling forward up and down the undulations until somewhere it reaches an insurmountable barrier and stops.

We circumnavigated that entire group of mountains, and with our glasses searched every side and summit, confident that we would strike several bands of big-horn; but none were struck. On the Galleta Meadow there were many jack-rabbits, but they were as safe from us as if they had been in a zoo. Our long, circular ride brought us back to the abandoned wagons at sunset, and we had to pick our way campward in the dark; but the young moon was helpful, and by going slowly we successfully followed the trail.

On reaching camp we found that Mr. Milton had returned, successful. He had killed a five-year-old ram, and a ewe with horns that for a female sheep were truly very large. Naturally, we regretted the death of the ewe; but at the same time it was a good thing to have one fine, old female specimen.

Mr. Milton hastened to explain and justify the shooting of the ewe on the ground that she was the first sheep that he saw, and the camp was very much in need of meat. The ram was seen and killed a little later, as it dashed past him out of the crater of an extinct volcano of the conical species.

It was Mr. Phillips and Mr. Sykes who scored heaviest on that day. They returned through the darkness very shortly after the Doctor and I arrived, tired but triumphant. Mr. Sykes had two splendid new craters to his credit and Mr. Phillips had collected two lava rams. Of the latter, one was an Old Residenter, with magnificent horns, and the other was a five-year-old.

Mr. Sykes was fairly bursting with enthusiasm over the craters and the sheep, but Mr. Phillips's chief excitement was due to the astounding manner in which Mr. Sykes had put a hundred and fifty pounds of mountain-sheep ram on his back and carried it a mile down a terrible mountain side of rough lava garnished with choyas, to the horses. I never knew any feat of arms—or of legs—to so arouse John M. as did that; but when I saw that mountain side, a few hours later, I fully understood the case.

That night we feasted on mountain-sheep steaks that were young and tender; and everybody gormandized except me. I never saw any other white men eat as did my companions on that trip! But, after all, I enjoyed seeing their enjoyment. Boys will be boys; and out in the wilds where there is much to do and no one to criticise, why should they not for once eat all they want?

The next morning, early and brightly, we set out for the craters and the scene of carnage. First we went to the crater which the Boys said was "shaped like a clover-leaf." It is north-west of the Papago Tanks, distant about three miles, and as seen from below there is nothing visible save a rather steep ridge with a level line for a summit.

Sykes Crater, Looking Southeastward

Circumference of rim, nearly three miles. Pinacate Mountains and Peak in the distance.

This crater is deeper than the Doctor's crater, and in saying that it is shaped like a clover-leaf, the Boys described it very well. Two of the leaves, toward the east and south, embrace about four-fifths of the floor area. The third one, which is in the north-west corner, is a tiny one—about one-fifth the whole. The three leaves are divided from each other by buttresses of lava that are built up against the main wall.

As in honour bound, Mr. Sykes climbed down into that crater to measure it. He found it to be two hundred and fifty feet deep, one thousand five hundred feet wide at the bottom, and its rim was nearly a mile in circumference.

In honour of Senor Olegario Molina, Secretary of the Department of Fomento, of the Republic of Mexico, who is worthy of much honour, we named that discovery Molina Crater.

But in craters, the Wonder of wonders was reserved for the last. The record-breaker rises—and also descends—almost due east of the Papago Tanks, The foot of its final slope upward is, by Mr. Sykes's pedometer, three and a half miles distant from our camp, across a stretch of very rough lava. It is half a mile from the foot of the steep slope to the top of the rim, and a mighty stiff climb at that. But for the sheep to be brought down, Mr. Phillips and I would have left our horses at the foot of the cone; but, knowing that we would need them higher up, we dismounted and led them zigzagging upward.

I thought that the descriptions of the two excitable members had prepared my mind for the Sykes Crater,

and that I could take it quite calmly; but I was wrong on both counts. No man—unless it be one who is thoroughly crater-wise—can absorb from any man's description, or from any picture, an adequate conception of that abyss. You seem to stand at the Gateway to the Hereafter. The hole in the earth is so vast, and its bottom is so far away, it looks as if it might go down to the centre of the earth. The walls go down so straight and so smooth that at one point only can man or mountain sheep descend or climb out. There the roughness of the rocks renders it possible for a bold and nerveless mountaineer—as much as possible unlike the present incumbent—to make the trip.

Of course Mr. Sykes went down, bearing his aneroid and pedometer. The depth of it, from rim to bottom, he found to be 750 feet, and the inside diameter, at the bottom, was 1,400 feet. The bottom is about 150 feet above sea level.

In summing up the evidence he said,

"How far do you think it is around this rim?"

I thought "a mile and a half"; but to keep from being surprised I said,

"Two miles." And he said,

"It is very nearly three!"

The Washington Monument is 555 feet high. Imagine a round hole wider than the length of Battery Park, New York, going down so far that with the monument standing on its floor you would have to look down two hundred feet farther in order to see the aluminum cap on the apex.

The floor of the Sykes Crater is so far down that from the top of the rim one sees only a small portion of it.

You see a light stipple of vegetation dotted over the level sand, but it is impossible to tell anything about the character of it. Mr. Sykes found it consisted of the following species: Choya, giant cactus, palo verde, creosote bush, mesquite and galleta grass.

We lingered long on that breezy rim, gazing spell-bound into the abyss, and at the red lava peaks looming up high above the rim on both the east and the west. By way of contrast we turned occasionally and gazed off at the scowling, gnarled and rugged brown landscape surrounding the foot of the cone far below—a grim and terrible prospect, no less. Near at hand a thin sprinkling of ocatillas and choyas and lower down the mesquites and palo verdes strove to enliven the sullen lava-heaps with flecks of cheerful green verdure, and with pronounced success. If there is any spot on earth wherein it is possible to be thankful for a Bigelow choya, it is on a field of lava which lies scowling and raging at the heavens. The widely scattered splashes of pale green do something to take the curse off the lava.

On that particular morning the wind swept over the top of the crater with a violence which added to the weirdness of the scene. Gradually we worked our way around, eastward, to the highest point of the rim, striving as we went to "take it all in." At several points the apex of the rim consists of sandstone formed by the fusing of masses of volcanic sand under the influence of intense heat. It needed no stretch of the imagination to picture the hot breath of that vast furnace-mouth coughing up thousands of tons of sand, piling it on the rim, then licking

it with tongues of flame until it melted together and formed what we see to-day.

One might hastily suppose that the flanking peaks of red lava, east and west, had been thrown out of the Sykes Crater and piled up; but not so. They were formed of *molten* lava; and molten lava is not thrown up into the air. It flows out of the lowest notch in its parent crater, like so much red-hot metal, and slowly spreads over the surrounding country until it becomes too stiff to flow. Just how it forms elevated pressure-ridges, like arctic ice, I cannot imagine; and I pass the question higher up.

One thing, however, was perfectly clear. The whole three and one-half miles of lava lying between the foot of the Sykes Crater and our camp at the Papago Tanks came down from that volcano. At this point the bowels of the earth gave forth the lava that afterward piled up in brown hills and red crags along the north-eastern side of our camp plaza, and stopped abruptly there. You can see a large-sized detail of it in the picture that shows the members of the party in the group photograph.

And all this time, a patriarchal mountain ram, dead for a ducat, has patiently been awaiting us near the top of the highest lava peak on our eastward hand. We saw much rough lava in the Pinacate district, but our way up to that sheep was over the roughest of the rough. The worst of it lay in chunks the size of steamer trunks—red, deeply pitted on every surface and sharp on every edge. There was not a thimbleful of soil, sand or ashes, nor any other fine material. The greatest circumspection and

From a photograph by J. M. Phillips

The Carnegie Ram on the Lava Peak

nimble-footedness was required to carry one over it without broken ankles or cut knees. I have gone over the lava-fields around Vesuvius, but the worst that I saw there was like a smooth road in comparison with those cones at the Sykes Crater, and others elsewhere in that district.

When we finally reached the summit of the high cone that rose nearest to the crater, we saw before us a semicircular ridge leading away to our right, and Mr. Phillips said that the dead sheep lay on the farther end of it. Keeping upon the summit, we worked our way along for several hundred feet, then gingerly picked our way down the slope to the quarry. There we paused to look about.

We were on the side of a high and very steep mountain of red lava that was liberally garnished with Bigelow choyas—the meanest of the mean. A false step would have meant a fall of perhaps ten or twenty feet on lava blocks that would cut like knives; but there would have been no prolonged rolling. The lava was terrible, but the awful choyas that were so generously sprinkled over it were the crowning insult. Their millions of white, horn-like spines glistened in the sunlight and looked very clean and pretty, but the thought of stumbling and falling upon one of them gave me chills.*

And yet, it was down this very mountain side that yesterday Mr. Sykes, the invincible, carried the hundred-and-fifty-pound body of that five-year-old ram (minus the

* Mr. Sykes and Dr. MacDougal have very appropriately named the red lava peaks surrounding Sykes Crater in honour of Mr. John M. Phillips, and they appear on the map as Phillips Buttes.

viscera) at the imminent risk of falling and cutting himself in pieces. Once he did stumble against two choyas, and while his hands gripped the sheep the choyas simply filled them full of spines—of the worst and most painful kind in all the south-west. His account of this incident is as follows:

"When Mr. Phillips had killed his two bucks, and we had all duly gloated over the remains, I suddenly happened to think of the hungry looks of this crowd as we left camp this morning, and I realized that nothing less than a whole sheep would be of any use to it! It was therefore a matter of getting one of those carcasses to camp, at all costs. Since we were so far up the mountain side that the horses could not get within three-quarters of a mile of us, the obvious thing to do seemed to be to pick up one of those sheep and carry it to the horses; so I did it."

No wonder Mr. Phillips was moved to enthusiastic admiration of Mr. Sykes's splendid feat; and to his everlasting honour be it recorded that he celebrated the incident by presenting to the Invincible Geographer the mounted head of that hard-won sheep. As for Mr. Sykes—dear me! He regarded the carrying as nothing at all; but he did speak a little reproachfully of the treachery of Bigelow's choya when it had him at a foul disadvantage.

Before striking a blow at the dead ram, we sat down to rest, and hear how the sheep were found, what they did, and all the rest of it; and this is what Mr. Phillips told us while we listened and surveyed the scene of the tragedy:

"Mr. Sykes and I came up here late yesterday afternoon. We had spent the day over toward the north-

eastward, studying small craters and looking for sheep at the same time. Finally we decided to come back to this big one for another look about it, and we arrived here when the sun was about an hour high.

"We found it a very stiff and rough climb up the northern side of this peak; but we didn't waste any time resting, for besides being late it began to rain.

"When we reached that summit yonder I started to look over the east side, when Sykes whispered, 'Sheep!' Turning quickly, I saw him down on his stomach with an apologetic look on his face, trying his best to crawl into the ground for fear he would frighten the game. Charlie stood below him, peering down the south side of the ridge, apparently looking into the lava fissures that ran off toward the flats.

"For downright fiendishness and bloodlust, Charlie's face eclipsed anything I had ever seen. His jaws were set and his mouth was a straight streak, while his eyes glittered like the eyes of an angry snake. His gun was at his shoulder, and I saw that unless I got to him very quickly I would have the mortification of having travelled over three thousand miles to see a Mexican kill sheep. When I reached him he was still holding his point, and as I glanced down into the lava, about fifty yards away, I saw a five-year-old ram, with nice horns, with a ewe and a lamb.

"While I was looking for more sheep and a better head, the ram sprang upon a chunk of lava, standing broadside and offering an easy shot. Mindful of the hungry mob at camp, I carefully planted a .405 ball back

of his shoulder, and he rolled down on the rough lava. As the ewe and lamb started to run Charlie threw his gun on them, but I checked him forcibly, telling him we had all the meat we wanted. As I stood watching the two sheep bound away I heard him wailing in a mournful tone, 'Carne bueno! Carne bueno!' (Good meat!)

"Just then I heard a sharp exclamation from Mr. Sykes, and the next instant Charlie's rifle cracked. Whirling quickly, I saw a band of four rams, two of them with immense heads, both larger than the one I had killed, running up a ridge to the south-west. By the time I stopped Charlie's shooting the rams had disappeared in the lava, but through the rain we finally made out the white patch on the rump of one of them. Sykes, who had kept his eye on them while I was laying down the law to Charlie, said that the white patch belonged to one of the largest rams; and so holding my gun for three hundred yards I fired a shot at it, but without results. The next day, when the sun was shining, I discovered that the distance was only two hundred yards, and that I had overshot.

"Telling Sykes and Charlie to remain where they were, so that the sheep could see them, I slipped over to the north side of the ridge, and running to the west circled around under the summit to the south-east, to head off the sheep from the crater. I had determined that if the sheep gained the sanctuary of the crater I would respect it. Having hunted the big-horn on the sky-scraping northern Rockies, where he is as free as air, it was repugnant to me to kill one in a hole in the earth like a rat in a trap, where

From a photograph by J. M. Phillips

Measuring the Carnegie Ram

a club would have answered the purpose as well as a rifle.*

"I had not expected to find the sheep quickly, but as I raised my head over a ridge I found that they had moved, and the leader of the band was looking for me. He was standing on the lava ridge across the head of that cañon, on that pinnacle of red lava, outlined against the sky. At the base of the pinnacle, one to the right and two to the left, I could see the heads of the other rams, all looking directly at me.

"Just as I dropped on my knee to shoot, the setting sun broke through the clouds behind me, gloriously bringing out all the details. The leader was standing almost broadside to me, his massive head accentuated by the deer-like leanness of his neck and body. The shining sun and the falling rain had formed a rainbow directly back of the pinnacle on which the ram stood. What a wonderful picture it would have made for an artist like Rungius!† That magnificent ram, standing like a statue on the pedestal of red bronze lava, washed by the falling rain and lit up by the setting sun; on one side a head with horns quite as massive as those of the central figure, on the other the heads of two younger rams, and the whole group overarched by a gorgeous rainbow! Estimating the distance at three hundred yards, I held slightly over

* We were told that according to the Papago Indians, the mountain sheep of that region were in the habit of goin gdown into the craters to feed, and a favourite hunting method of the Indians was to find a herd in a deep crater having only one exit, and send an Indian into the abyss to scare the sheep upward. As the animals slowly scrambled up the steep slopes, the Indians were able to kill them with clubs.

†See the frontispiece, from a painting by Carl Rungius.

the shoulder of the big ram, and the big ball struck him fair in the heart. His legs doubled under him like a jack-knife and he slid off the pinnacle. Striking the rough lava, he turned over twice and then lay still, while his friends, after staring at me a few seconds, disappeared like shadows.

"As I turned back and picked my way over the fissures and broken lava, feeling like a vandal who had destroyed a beautiful statue, I heard Charlie's rifle begin to bang like a pack of fire-crackers. When Sykes joined me where the big ram lay, he said that the Mexican had been shooting at, and had perhaps wounded, one of the younger rams.

"The horses were at the west end of the crater, so we sent Charlie to bring them as close as possible. I then photographed Mr. Sykes with the ram, and, as I told him the story of the rainbow, he became 'powerful sorrowful.' We soon put the last sheep into shape so that it wouldn't spoil, and after tying a handkerchief to his horns, to keep off coyotes, we scrambled over the ridge and across the cañon to where the other ram lay.

"By the time we had removed the entrails from No. 1 it was quite dark; and then Mr. Sykes and I almost had a row. It was my opinion that a hind-quarter would be sufficient for camp-meat, and that we could as well get the remainder later on. Sykes declared that having been out of meat for a long time, and not having tasted any mountain mutton for years, he was equal to a hind-quarter himself. He asked whether I thought we were hunting worms for a nest of young robins or trying to supply meat for a lot of starving land pirates?

"I didn't think he would get very far with the hundred-and-fifty-pound body of that sheep, but in order not to be out-done, I concluded to pack in the head. Sykes swung the carcass to his shoulder and down into those black lava fissures, garnished with that devilish choya, we went. I led the way with an 'All-ye-that-enter-here-leave-hope-behind' feeling.

"Loaded down as I was with my gun, my camera and the head of the sheep, the irregular chunks of lava, like fragments broken from a large mass of glass, punished my feet severely. On that steep mountain side the footing was so uncertain that I was afraid of falling and landing on a choya, and perhaps putting out an eye. I felt very sorry for Mr. Sykes and was afraid he would fall and hurt himself; so after going some little distance I checked up and begged him to throw down his burden until the morning. But that man of iron appeared to be tickled to death with his load of meat, and held onto it like an English bulldog.

"Two or three times in that terrible descent I checked up and begged him to throw down the sheep and rest; but he replied that it would get full of choya spines, and that a porcupine would not be a nice thing to carry. Finally I lost him.

"Returning, I found him extracting, without even swearing, a lot of choya spines that the dangling legs of the sheep had driven against him. Again forced along without rest by that relentless man of iron, self pity made me hope that he would have to give up his task, and would then assist me in bearing my burdens, which at every step

seemed to be getting unbearably heavy and more difficult to carry.

"Finally, after going about a mile we became bewildered in the lava beds, but after a lot of shouting we found Charlie and the horses tangled up in a big fissure. At first I thought it would be impossible to get out in the dark; but finally we reached camp."

It is not to be believed, however, that during any interval of time we remained indifferent to the first big ram of the lava beds. He was a personage. Only the man who himself has gone in quest of the unknown, and found it, can understand the peculiar tingling sensation which the first touch of that specimen imparted to our nerve-centres and finger-tips. For days and weeks we had been asking each other, "Will we find sheep on Pinacate?" and, "If we find any, will they be Nelson's sheep or the Mexican species?"

In the natural order of things, I expected *Ovis nelsoni*, the type locality of which is found in the Funeral Mountains on the bias boundary between Nevada and California. If this expectation were realized on Pinacate, the sheep would be of a pale salmon-pink colour, like the type specimens.

One good, searching look over Mr. Phillips's splendid ram was enough. It had the same horns, the same white nose, the same body colours and white rump-patch of the well-known Big-Horn of Wyoming, Montana and British Columbia. The stature of the animal was perceptibly smaller, its hair was much shorter—as became a hot-country sheep—and its body colour was a trifle rusty from

sunburn, but the thundering big horns, the colours and the whole ensemble of the animal said as plainly as print, "*Ovis canadensis*—the true, old-fashioned Rocky Mountain Big-Horn, no more, no less."

No matter how many *mexicanus* lie eastward of Sonora, no matter how many *cremnobates* or what not run down the Peninsula westward of the Gulf, the Big-Horn of blessed memory goes down the eastern side of the Gulf; and this is It.

On reaching my home office I made haste to compare the skull of a Pinacate ram with that of an *Ovis canadensis* from south-eastern British Columbia; and not one difference could I find.

We carefully measured that ram, with the following results:

Height at shoulders	37 inches
Length of head and body	54 "
Tail	5 "
Circumference behind fore leg	42½ "
Girth of neck (unskinned)	17½ "
Height of ear	4¼ "
Circumference of horn at base	15½ "
" " half way out	14½ "
" " one inch from tip	5½ "
Length on outer curve	37¼ "
Distance between tips	16½ "
Weight of sheep, entire	192½ lbs.

That specimen was a very old one—a genuine patriarch. On the previous evening Mr. Phillips had generously offered its flesh to Charlie Foster, with which to make for himself the kind of dried meat called "carne

seco"; but Charlie had politely declined it, saying, "Me no want him." I wondered at this—until I handled the dead animal; and then I understood Charlie's extreme self-denial. Nothing short of a New York hash-mill, speeded to the limit, ever could have masticated that lean and tough flesh.

The ram was so old, and so poorly off for lower incisors, that he was thin and bony. He carried not a pound of fat, and all the salient points of his pelvis were visible. He was the only lean-and-poor mountain sheep that I ever saw in the wilds, and it will be noted that his weight was all of fifty pounds under what it should have been. Fortunately, however, his pelage was all right, and his horns were immense; so we blithely preserved his skin entire for the Carnegie Museum at Pittsburgh.

His stomach was reasonably well filled, with the following: Galleta grass, palo verde, torote prieto, *Sphaeralcea*, and white brittle-bush (dead flower-stalks only).

There was one feature of that sheep episode that was deeply impressive. It was the awful surroundings amid which those animals had chosen to live. Aside from hot volcanic débris, I think it is impossible to imagine any spot on dry terra firma that is more inhospitable, forbidding and terrible than those steep mountains of cruel red lava garnished with Bigelow's accursed choya. We were simply fascinated by the unearthly and nether-world character of our surroundings. Doré would have reveled in this scowling, contorted, wholly blasted spot.

"*Why*," we asked each other, "should any sane mountain sheep ever ignore such glorious feeding grounds as

the granite mountains beside MacDougal Pass, or the meadow of galleta grass that surrounds it, and make a home on the lifeless lava of Pinacate?" No predatory animals—not even man—drove these sheep hither for safety. They would be far safer on the granite summits. It cannot be the water in the Papago Tanks; for these sheep drink so seldom that the natives sometimes say most seriously,

"They never drink water!"

Mr. Phillips made some excellent photographs of the dead ram and its surroundings, the best of which are submitted herewith; but no photograph ever can convey to the mind of one who never has seen the like an adequate conception of the savage grandeur and the scowling terrors of that scene. It was like Dante's Inferno on the half shell. That lava looks as clean, as fresh and as sharp as if it had cooled off only yesterday; and for lava it is very red. How it is possible for even the accursed choya to live upon it in summer, when the heat registers 130 degrees in the shade, and the lava is almost sissing hot, only the desert botanist can tell.

It is an uncanny country, filled with weird and awful things. But for the sheep and the choyas we might easily have imagined ourselves upon one of the blasted and dead landscapes of the moon.

CHAPTER XV

DOGS IN CAMP

Doubtful Dog Experiments—The Troubles of Bob—The Troubles of Bob's Friends—A Dog with no Savvey—Rex and Rowdy—A Canine Glutton—Rowdy's Contract at the Papago Tanks—His Waterloo—The Sickest Dog on Record—The Bad Break of Rex.

CAMPING with dogs is much the same as camping with men. It is all right if you know your dogs in advance and exercise an option; but when you do not, it is different. I am fond of dogs—in their proper place; and in about nine cases out of every eight, a hunter's camp is no place for them. Kaiser Smith, of the Canadian Rockies, was distinctly different; but Kaiser was a Wise One, and knew how to make good.

Every proposed camp-dog is doubtful gravel until panned out. In a camp where skins are being preserved and cured, there is always the danger of poison; and Heaven help any hunter who, wittingly or unwittingly, poisons his friend's favourite dog. No one knows why it is, but every man, no matter how "ornery" the pup may be, loves his own dog and sees in him things which seem to justify his existence, even long after all other persons have wished him in the canine paradise.

While we were trailing westward from Sonoyta, travel-

From a photograph by Godfrey Sykes

The Members of the Expedition, on Porous Red Lava, at the Papago Tanks

Jesse D. Jenkins	Charlie Foster	George Saunders	Frank Coles
Dr. MacDougal	Mr. Phillips	Mr. Milton	The Author

ling hard and doing no taxidermic work, Jeff Milton's dogs, Rex and Rowdy, were not at all bad. It was later on that they made their records. Frank Coles's Bob was a nuisance, nearly every waking hour, from the day that his front foot was run over. He was compelled to ride in one of the wagons, because walking was impossible for him; but by a most curious process of thinking, when off the ground he always thought that walking was quite as easy for him as riding! As a result, he was continually desirous of jumping off the load, and perpetually striving to do so. Lie down quietly while riding, he would not. Half the time some one held him forcibly, and beat him the other half to make him lie down. When we were travelling above Sonoyta, Bob wore out an average of three men per day.

We thought that his first foot under a moving wheel would make him wagon-wise: but it did not. No sooner had we cured his first hurt than he immediately achieved a second one, similarly. How he managed the doing of it no one ever knew, but at all events the little mole-headed dog succeeded in getting his left hind leg run over, without being killed. The tibia was fractured, beyond doubt; but it might have been worse. Again we bandaged him up and poured on arnica, and again he blinked at us and wigwagged his thanks. For the next week he was a quiet invalid, and made no more trouble until we began the return journey.

Going up to Gila Bend, I thought he would drive Frank Coles to drink; and sure enough he did. Bob's lame leg No. 2 was nearly well, and every time we jumped

a jack-rabbit he was wildly ambitious to jump off and chase it! As well might a chipmunk chase an antelope. Bob was held with a leash, he was held by the neck and ears, by injunction, by *lis pendens* and *quo warranto* proceedings. But a hundred and fifty times per day did he struggle, suddenly and wildly, to get free and leap overboard. On about one hundred and forty of those occasions he was beaten almost to a pulp, only to come up smiling ten minutes later for another trial. It required all the time, strength and attention of one able-bodied man to hold that absurd little lame cur on the top of the load where the rest of us dwelt during the flight out of Egypt.

Once Frank Coles said to me in a low, sad voice, like a man in confessional,

"I've wished a thousand times since we started that I'd left him at home! He don't seem to savvey a trip like this even a little bit."

In good sooth, we gave Bob too much credit at the off-go, and he deceived us all.

Of the two other dogs, Rex, the older one, was not so bad; but Rowdy was an unmitigated Case. He was a fully-grown but only half-baked pointer-cur, with a brain like an affectionate pet monkey and the appetite of a hyena. The first time I saw Mr. Milton feed him and Rex, he established his reputation and justified his name. While Rex soberly and decorously took one good mouthful from the pan, Rowdy made two quick passes, four gulps, and presto! the pan was empty! Rex looked at him reproachfully, with a pained expression on his solemn countenance; and then we knew why the older dog's

ribs were so conspicuous. Rowdy smiled genially at Rex, and all of us, and wagged his tail for more. No wonder he was fat, the gourmand.

It was at the Papago Tanks that Rowdy met his Waterloo. His decline and fall began on the day that the first sheep were killed and brought in. With his usual care for their comfort, Mr. Milton gave Rex and Rowdy an ample civilized feed of sheep scraps. Our good friend Jeff was almost painfully conscientious in providing for the comfort of his horses and his dogs.

With four sheep in camp to be worked into food and preserved specimens, meat scraps and trimmings of sorts began to accumulate rapidly. In that dry atmosphere, fresh meat remains fresh and sweet for many days. I had arsenic and alum, but dared not use a morsel of either save on the scalp of Mr. Milton's sheep, at his special request, because I feared an accident with some of the dogs. Later on, I gave myself an hourly compliment for having had sufficient intelligence to adopt that policy, and adhere to it.

Rex was very reasonable, and knew one thing that thousands of human beings do not know. He knew when to let go! Instead of gorging himself on sheep meat, he ate reasonably each day, stopped at enough, and acquired merit.

But not so Rowdy. He was a dog of vaulting ambition, but utterly lacking in the divine sense of proportion that keeps dogs and men out of trouble. He undertook to consume all the waste mountain sheep that covered a zone two hundred feet wide around the camp. For days he

laboured at the task, early and late, and often he worked overtime, by moonlight. In the small hours of the morning we used to hear the steady rasp of Rowdy's molars on pelvis and femur, mingling with the weird falsetto of envious coyotes, and then we dreamed that we were back in New York, listening to music on the phonograph.

About the third day after he began operations on a large scale poor Rowdy became ill. As soon as it became evident that his case was serious, we began to give him medicine, in doses of work-horse size. He developed a case of fever, which looked very much like distemper, but fortunately was not. Our remedies made no impression upon him, and when finally we started home from the Papago Tanks, with Rowdy in my charge, because his master had ridden ahead to the settlement, I thought he could not live to Sonoyta. Instead of dosing him further with medicines, I decided to try starving him, relying upon Nature to see him through. Although at first too sick to hold up his head, we gave him a good bed and plenty of water to drink, and at last he actually began to improve. By the time we reached Sonoyta he was decidedly better, and after our departure he presently recovered. For an overfed dog of any breed, great or small, the best medicine is starvation!

The worst error made by Rex was on his last night in camp with us, at Santo Domingo. By a brilliant and quite unusual stroke of genius some one tied him to one of the wagons—a circumstance most fortunate as it proved —and about the only time it was ever done. Just before supper was served Dr. MacDougal took a lighted lantern

and started to walk past the end of the wagon to which the dog had been tied. Like a thunderbolt out of a cloudless sky, Rex sprang up and with fearful growls lunged forward at the Doctor, *to bite him!* A more savage attack I never saw made by a dog. Rex seemed eager to tear a good friend in pieces. The Doctor swung his lantern fairly into the jaws of the raging dog, and quickly backed one or two paces beyond his reach; which seemed to make the animal all the more angry. Had Rex been free and made such an attack, the results might have been very serious; especially to the dog in the case.

The next day we parted company with Rex and Rowdy, and we shall meet them no more in this vale of tears.

CHAPTER XVI

THE CACTUS DISPLAY FROM TUCSON TO PINACATE

Desert Plant Life More Interesting than Animal Life—The Cacti—The Giant Cactus—Its Culmination at Comobabi—Diminution Southward and Westward—Structure—The Organ-Pipe Cactus—The Finest Specimen—The Barrel Cactus and Its Water Supply—A Demonstration Beside the Trail—Cactus Candy—Small Forms of Echinocactus—Bigelow's Accursed Choya—The Pain of an Encounter—Mr. Sykes's Accident—Strength of Spines—The Tree Choya—Opuntias—Leafless Bushes with Water-storage Stems.

ALTHOUGH my leanings toward zoology are sometimes apparent, I am compelled to admit that, in constant and absorbing interest, the plant life between Tucson and the Gulf of California easily ranks the animal life. The latter is intermittent, it is very much the same as that found over large areas elsewhere, it contains little that is strictly new, and still less that is unique. Now, if one should find a land in which all animals are unlike the familiar genera, and every creature odd and startling, the plant life would be slighted, and we would have—another Australia!

I defy any intelligent human being to mix up for thirty days with the abounding cacti of the finest region of the South-west without becoming keenly interested in them. In one way or another, each species will impress itself upon the traveller, until at last he feels a proprietary interest in them all. For example, Mr. Phillips has most

tender recollection of the Bigelow choya,* and that species will not soon be forgotten by him.

Far be it from my purpose to write a treatise on the cacti of our trip; but I cannot refrain from attempting to give the Reader a few of my impressions of them. They were the most striking botanical features of that land of strange things.

When the traveller breaks into the desert country at Tucson, the first plant that specially attracts his attention is the Giant Cactus, or Saguaro, the Mexican name of which is pronounced Sa-*war'*ro. It is shy of the creosote-bush plains, but in the ridgy and rocky piedmont country it is found growing in thousands. Where the rocks are all-pervading, and the tiny soil-pockets are few and far between, it modestly erects its dark-green accordion-plaited stem to a height of twenty feet or so, unobtrusively puts forth a small, short branch, and stands pat.

I have already insinuated that in the foothills around Tucson the Saguaro affects the fence-post style of architecture. In practically all the plains and so-called "valleys" that are given over to the exclusive use of the abounding creosote bush, it is, as a rule, totally absent. It is plainly evident that *Cereus giganteus* does not like the "creosote association." In the Avra Valley, for instance, you see not one Giant, but the moment you strike the mountains beyond, they abound.

Throughout our overland trek of two hundred and

**Opuntia bigelowii.* Its common name is Spanish, and is spelled cholla; but the United States Government has decided to spell it as it is pronounced, "choy'a," and that authority is good enough for me.

twenty-five miles from Tucson to the Gulf, I watched closely to see where the Giant Cactus species culminates. It is in the vicinity of the Comobabi Mountains that they grow the tallest, the largest, have the greatest number of arms, and the largest ones. It was in an adjacent plain, heavily overgrown with mesquite trees, that we found the finest specimens. With outrageous pride I present herewith my photograph of the finest specimen between Tucson and Pinacate—a Giant indeed, between fifty-five and sixty feet high, with nine huge arms and two woodpecker holes. I regret that Mr. Phillips did not stand close beside the stem, but he was sensitive about being photographed with a plant so many times taller than himself.

Beyond Wall's Well the Saguaros steadily declined in stature; and at Sonoyta they are only one-half the size they attain at Tucson. On the lava beds of Pinacate, and at the edge of the sand-hills, they shrink to pygmy size, rarely exceeding twelve feet in height, and often as low as seven. But it is a brave plant, especially in adversity. We found it on the awful lava of Pinacate, at an elevation of 2,500 feet, where there was not an ounce of soil. It was also at the bottom of MacDougal Crater, at the edge of the sand-hills, that sank almost to sea level. We saw only one species, but I am told that only a little way beyond monument No. 180 the larger species, *Cereus Schotti*, is found in two localities near the Tinajas Altas Mountains.

The Saguaro seems to serve only two important functions—to entertain and cheer the desert traveller, and to furnish high places for the nests of woodpeckers. There is nothing about it with which to eat, drink or make; and

we are very glad of it. If each stem could be made to yield anything marketable at a profit of fifty cents, the species soon would be exterminated. Arizona and the other states of cactus-land should make it punishable by $1,000 fine and ten years' imprisonment to discover anything of commercial value in *Cereus giganteus*. The human race is not yet so destitute of the necessities of life that we need destroy everything that delights the eye.

When we saw the Saguaros of Arizona they were ready to burst with plenteousness. Each stem and branch is built on the accordion plan, with the little spine-clusters studding the outer angles of the plaits. When Arizona is long on heat and short on water the whole plant shrinks, the pleats close together, and the circumference diminishes.

In a good rainy season, however, when the stem fills full of water, the accordion plaits expand and straighten out until they can expand no more. We saw the Saguaro at its best—after a season of abundant rain. We did not, however, see it in flower, for it blooms from March to June, and is then crowned by wreaths of white blossoms.

It is natural for the woodpecker to love the Giant Cactus, and carve out nest-holes in its upper regions. The digging is easy, the apartment within is moist and comparatively cool, and there is nothing that can molest him or make him afraid. The bird which inhabits this plant is the red-shafted flicker (*Colaptes cafer collaris*), of which we saw perhaps thirty or forty individuals.

I was much interested in the woody portion of the Giant Cactus. So far as I know, the arrangement of it is quite unique. Imagine, if you please, a column of cactus

pulp twenty feet high and twelve inches in diameter utterly lacking means of support, visible or invisible. Imagine that around this there is set a compact circle of fishing-rods of tough white wood—smooth, perfectly uniform in size and about an inch in diameter. This is the woody skeleton of the cactus, and of course it is not visible until in death and decay the outer covering of the "tree" falls away and exposes it.

In the Desert Botanical Laboratory Dr. Cannon showed us a drawing which recorded the result of his studies of the root habits of the Giant Cactus. It appears that the roots run in all directions, for an enormous distance, sometimes reaching fifty feet or more. They lie very near the surface in order that after a shower of rain they may greedily absorb all the moisture they can reach, and in all haste pour it into the stem of the Giant—which is, after all, a sort of green-vegetable stand-pipe.

For the past two pages I have been striving to let go of *Cereus giganteus;* but there is one other point that really must be mentioned. It is the everlasting variations of the branches. The stem is a stately and dignified product, and under no fair conditions does it voluntarily lean over, or develop a kangaroo dip, Grecian bend or any other outlandish form. It is as straight as a flag-pole.

But not so the arms. Ordinarily they are developed on the candelabrum pattern; but in thousands of cases they cut up capers of many kinds. The total number of their variations in Arizona runs up into the trillions, and hurts one's head. They leave the parent stem at all possible angles; they twist and droop and cavort and

"sasshay" in all possible directions. Sometimes they almost tie themselves into bow knots. It is these bewildering variations—in the big specimens—which make them so consumedly interesting throughout the whole course of a long trip. The acquaintance of the Arizona grand army of Saguaros alone is worth the price of a trip to Tucson.

I am sincerely sorry that the Average Traveller does not easily get in touch with the Organ-Pipe Cactus,* or Pitahaya. Its other English name—Candelabrum Cactus—is an inexcusable misnomer. The branches of an orthodox candelabrum do not spring from the *base* of the candlestick. The Saguaro, however, would fit that name admirably, but for one thing; it never gets the chance to wear it. And such is the unfitness of things in all civilized countries.

West of Tucson the northern boundary of the Organ-Pipe is about forty miles south of the Southern Pacific Railway, at the Ajo Mines and the Sierra Blanca. It is distinctly a piedmont, or foot-of-the-mountain, species, and it capriciously clings to the decomposed granite at the foot of the mountain slopes, which it fondly imagines to be soil. It overlooks the lowlands of its habitat, and is itself well placed to be seen of men.

Of course at its farthest north it grows small, and few-in-a-hill. We saw it at its best in the Sonoyta valley, where the giant cactus was decidedly on the wane. Dr. MacDougal and Mr. Phillips photographed some very good specimens at Sonoyta, but the giants I photographed

**Cereus thurberi.*

just beyond Agua Dulce make theirs look so much like pipe-stems that I feel sensitive about showing my picture.

Like the sailor who remained alone on a sinking ship in order that he might for one hour know how it felt to be a vessel-owner, and fabulously rich, I owned for a whole half-hour the finest Organ-Pipe Cactus between Tucson and the Gulf. It contained twenty-two stems, the largest of which were twenty-two inches in circumference and twenty feet high. The stems were formed on the same plan as the saguaro, and on the one nearest me I counted seventeen accordion plaits. The spines were short, dark and few in a bunch. The longest ones were only an inch in length, and there were about twelve in each bunch. The woody portion of a Pitahaya stem is solid wood, like a branch of a tree.

Close beside the king clump of Organ-Pipes were two others almost as large, and one that was smaller. The stems of the large ones were so many and so thick that they actually cast a shade in which a Mexican or an Indian might have lain down and slept. And this reminds me that to the native the Organ-Pipe Cactus is much more than an interesting botanical specimen. It not only yields two fruit crops annually—in July and October—but it yields them without the slightest outlay in labour. The fruit is such excellent food that on the Papago bill of fare it is an important item; and the Bean-Eater does not need to look at the right-hand side of the menu in order to determine whether he will order it or not.

The Barrel Cactus, or Bisnaga,* is the Traveller's

**Echinocactus wislizeni.*

From a photograph by the Author

Extracting Water from the Barrel Cactus, or Bisnaga

Friend and also the leader of a group of very picturesque species. As its name implies, it is as large as a small barrel, but far better in drawing. The pictures show its form and size more forcibly than could any description by me. It is to be noted, however, that a two-foot Bisnaga and a baby giant cactus of that height so closely resemble each other—to the careless eye—that one is easily mistaken for the other.

But the adult Barrel Cactus is a vegetable to be reckoned with. It is portly, dignified, deeply grooved and elaborately enmeshed in long, curving spines. If your points of the compass go wrong, Jess Jenkins will tell you that "*every* Bisnaga *always* leans toward the south." In good truth, the great majority of them *do* lean that way —for sundry reasons—and those which do not are the rare exceptions.

On one count the Bisnaga is to the desert wayfarer the most valuable plant of all cactus-land. In times of stress for water the man who is tortured by thirst and heat can draw from it a *cool and copious drink of water* which surpasses the ambrosia of the gods. In the tropics, where there is water to throw away, there are several plants that yield a copious supply. In Borneo a Dyak introduced me to a liana, or climbing vine, the stem of which poured into my cup a supply of water like the flow from a small faucet.

It is easy to imagine a traveller on the Arizona desert with a leaky water-keg suddenly finding himself beset by thirst, and twenty miles from the nearest drink. Now in the Arizona summer a man needs about two large gal-

lons of water per day, and a complete cutting off of the supply soon spells torture. It is in the rocky foot-hills that the Bisnaga may most confidently be looked for; but many a plain or slope *which produces the mesquite also* is provided with them.

Imagine, then, the desert-wise traveller on an August day, the awful heat roasting the marrow in his bones, burning his lungs and cracking his throat with dryness, arriving alongside a fine, fat and healthy Bisnaga. With the help of a little knowledge and a large knife a gallon of good water is assured.

It was on our third day out, as we drove over the rolling, stony eastern foot-hills of the Carobabi Mountains that Dr. MacDougal briefly halted the expedition to enable us to drink water from a Bisnaga. With his machete—which is really an Iowa corn-cutter of Mexican antecedents and Connecticut manufacture—the Doctor deftly cut off the upper story of a fine specimen that stood beside the trail. The object lying upon the ground in the picture is not a new circular saw, as it appears to be. It is the inverted top of the Bisnaga, and the whiteness of it is the meat which contains the water.

From the nearest palo verde Mr. Sykes cut a section of smooth, green stem and formed it into a pounding-stick. It is necessary to choose for this purpose a tree that does not yield bitter wood; for with the wrong kind of a battering-ram the flavour of the drink might easily be impaired.

At once Mr. Sykes began to attack the central surface of the decapitated Bisnaga with his palo verde pounder,

and white bits of cactus-meat began to fly like sparks from an anvil. Several handfuls of the pulp were lost because there was nothing to contain them; but presently a cavity began to form. In this the meat was pounded to a pulpy mass, and in it water began to appear. The man whose hands were cleanest was invited to take out some of the waterlogged pulp and wash from his hands the tertiary deposit of desert drift; which was done. Then the clean-handed party proceeded to squeeze the pulp between his hands and throw it away.

By alternate squeezings and poundings about three pints of white water soon was accumulated; and we were invited to step up in orthodox fashion and drink out of our hands, as do lost men on the desert. The water was surprisingly cool, a trifle sweet, and in flavour like the finest kind of raw turnip. I fancied that its well-defined sweetness might detract somewhat from its power to allay thirst, and later on I was not surprised when Dr. MacDougal introduced us to the cactus candy, or "pitahaya dulce," of Tucson.

There is only one drawback to that cactus candy. The supply is erratic, and at times invisible. I ransacked the city for candy-stores, went through them all, and the sum total of my quest aggregated only two paltry pounds. That was the whole visible supply. But what the Bisnaga goods may lack in quantity it makes up in delicacy. It is the most delicious product of the South-west, not even excepting the preserved figs of California. If the supply were only constant, one might say that it is worth a stopover at Tucson.

The great Barrel Cactus was found by us from near Tucson to Sonoyta. At the international boundary it was replaced by a small relative, similar in form but of diminutive size, growing in clusters. It was most conspicuous on the Pinacate lava fields, where its purple-green skin and light gray spines were brought out in sharp detail against the dark metallic ground-work of volcanic débris. The species most in evidence was *Echinocactus lecontei;* and its strange, weird-looking clumps fitted in well with their uncanny surroundings. The deer I shot at Cubabi Mountain had been feeding on the fruit of this species.

One species, which was found at the last moment, was covered with a perfect *cheval-de-frise* of long, hooked spines of a beautiful crimson colour, and it was so much of a rarity that specimens were taken back to Tucson.

The Bisnagas bear the longest spines of any of the Arizona or Pinacate cacti, and on some of the species they cover the whole exterior of the globe with a tangled mass that to the average wild beast is impenetrable. On the night when we started in to be benighted on the edge of the Tule Desert, and were most unwillingly rescued, Dr. MacDougal quickly found and brought in an *Echinocactus emoryi* about as large as a modest man's head. By courtesy that species is considered edible. To me, however, it seemed ineligible to the class of edible foods for men.

The fruits of the barrel cactuses are much sought by deer and sheep—as they should be; for there is every reason why hoofed animals should like them. The very young and tender saguaro plants, two feet high, are fre-

quently eaten near the ground, quite down to the small woody central stem, so that many times we found the plant looking like a pineapple standing on a wooden peg. Just what animal thus feeds on the small barrel cactus I could not determine to a certainty; but I suspect it was the jack-rabbit. This is the only way in which the giant cactus ever is eaten by wild animals (s. f. a. k.).

The Choya Cactus group must be approached with outrageous caution. First, one may well pray to be spared from coming in personal touch with any of its members; and secondly, that in the event of contact, grace may be given to enable you to go on through life without using language.

I have been cut, and bitten, and torn, and crushed; but never have I felt any other pain, great or small (save the violent puncturing of an ear-drum), that was as exquisite and nerve-searching as those made by the spines of Bigelow's Accursed Choya. Their entrance is very painful, but their exit is worse; and the aftermath is like rheumatism of the eye. They say that is like a very bad toothache, magnified one hundred diameters.

The worst thing about that Choya is its treachery. In November it sheds those awful joints, and the ground is littered with them. They lie there like so many innocent-looking silvery chestnut burrs, rather pretty to look at, to be sure; but each one contains all the materials for serious trouble. Of course no man can adequately look out for them until he has suffered at least once; and in times of excitement they are forgotten. In accidents, of course, the situation is beyond control, and no one is to

blame. In chasing a sheep, or in carrying a sheep or a head on a steep mountain slope, you slip, or a foothold gives way, you drop a foot or two unexpectedly and—bang! A little spiny devil is fastened to your hand with a dozen or twenty spines like barbed whalebone piercing your unhappy flesh.

The world stops revolving, then and there. At first the pain paralyzes your arm; then you hold still and pity yourself. If the spines in your flesh are sufficiently numerous and deep-seated, the pain strikes to your stomach! In a minute or so you recover your poise and enter the stage of apostrophe; but you find that the English language is weak and poverty-stricken in words which will do the subject even-handed justice.

Then you gingerly dispose of your burdens, get out your hunting-knife—if you have one whole hand in commission—and open its longest blade.

I invented this scheme, and the boys thought it a good one: thrust the blade of your knife far through the stickers of the Choya joint, between your flesh and the body of the offence. When the edge of your blade has secured a good hold on the Choya, give a quick and mighty heave outward; and, if all goes well, the spines will be simultaneously torn, by main strength, out of your quivering flesh. If any remain, the tweezers you carry in your pocket must remove them, one by one. When they are torn out, the wounded spot literally cries out with all kinds of stinging and aching.

When your horse picks up Choya joints on his feet or legs, you must halt immediately and pass a relief measure.

For a quiet animal the knife-blade is the best thing; but if the joints adhere to the hind legs of a half-tamed, kicking mule, the situation becomes keenly interesting. Of course no man with a drop of sporting blood in his veins will let even the worst mule travel along with Choyas in his skin merely because of the risks involved in removing them. Mr. Milton once showed me what to do in such a case. When our worst-kicking pack-mule picked up three or four Choya joints on his hind legs, below the hocks, I was puzzled; but Jeff cut a stout mesquite branch about three feet long, and trimmed it so that two branches made a neat fork at the tip end. While I held the animal very firmly by the head, Jeff spoke soothingly to it, slowly manœuvered along its side, placed the fork of his stick close against the nearest cactus joint, and with a sudden fierce thrust it was deftly dislodged. The mule flinched, but otherwise took the matter rather calmly.

"I guess he savveys the reason for it, all right enough," observed Mr. Milton; and in a very short time the animal's legs were free.

Mr. Sykes once dwelt with amused interest on his mishap when carrying that second mountain sheep down an awfully steep lava mountain garnished with Bigelow Choyas. He nearly had a bad fall, and in saving himself his clenched hands drove against a lot of Choya joints that lay scattered upon the lava. Both hands were so filled with them that one hand could not free the other; but finally he used his teeth to liberate one hand and get it into working order.

Bigelow's Choya belongs to the same genus as the prickly-pear, but the two look not in the least alike. It is low in stature, usually under three feet in height, and by its short, stocky joints, growing one upon another, you may know the genus to which it belongs. It has a pronounced stem, upon which grow many branches as long as your finger—no matter which finger you choose—each of which is studded with an enveloping mass of long, whitish-green spines. The spines are flattened, seemingly as strong as whalebone, and of incredible persistence.

In November the branch-like joints, each a solid mass of spines, drop off the parent stem and lie thickly on the ground below. Beware of them, standing or sitting. The spines will go through the side of an ordinary shoe almost as if it were manila paper. If you wear horse-hide shoes, with soles a trifle soft and flexible, a Choya joint well trodden upon will thrust its stickers into your sole, and hang on while you walk away with it. Rake it over a chunk of lava, and at first there is no result. Finally, when you smash off the main body of offence, a lot of the spines will remain, independently, until your travel literally grinds them to pulp. That process is not wholly without its compensations. It seems like getting square with *Bigelowii*.

We found this interesting plant from Tucson to the south end of MacDougal Pass, and thence all over the lava field to the very top of Pinacate.

The Tree Choya* is more of a wonder and less of a curse than Bigelow's. As we saw it, its average height

Opuntia versicolor.

Bigelow's Choya—*Opuntia Bigelowi*

From a photograph by D. T. MacDougal

A Broad-Leafed Prickly Pear (*Opuntia*), at Sonoyta

was between five and seven feet, but I am told it grows as high as ten feet in the clear. A fine specimen in MacDougal Pass is shown herewith, and it may well be regarded as typical of the species. It might very well have been named the Wren Choya, because it is the species so much beloved of the cactus wren. In the fastnesses of the Opuntia's spine-covered branches, the wren builds its nest, and in peace and comfort rears its brood. It fears neither hawk, coyote, fox, nor serpent, for its fortress is impregnable. We saw at least two score of nests, often so judgmatically placed in the centre of dense masses of thorny stems as make their occupants perfectly secure from all attack. And let no man insult the intelligence of that bird by asserting that this selection of a protected nesting-site is a mere mechanical process, devoid of reason; for if he does, few persons of intelligence will believe him.

The stem of the Tree Choya is peculiar, in that it is covered with a network of small green pustules. The interior is bounded by a cylinder of hard wood of most peculiar pattern—chased all over on the outside, and full of elliptical holes set in most orderly array. Of course we opine that each external pustule corresponds with a hole in the woody stem. When a Tree Choya dies, both its pulpy outer surface and its centre decay and disappear and there remains standing only the woody skeleton of the tree. This stands for months longer, until the wood bleaches to a clean light-gray colour, and then it looks like a tree of carved fretwork.

The spines of this Choya are mild in comparison with those of the Bigelow species, and its joints are not ghastly

traps that lie in wait for the unwary. Their fleshy exterior naturally suggests food for wild animals.

Of flat Opuntias (Prickly Pears) we saw very few. Nowhere did they spread for yards over the helpless earth in a thorny and horrid mat, as in Montana, cordially hated by man and beast. The few specimens that we saw were large-jointed, stately and immaculate, as if knowingly on exhibition. Of the twenty or thirty known species we saw perhaps half a dozen in all. The most interesting Opuntia record was a fine plant found at Sonoyta by Dr. MacDougal (figured herewith), that proved to be a new and undescribed species.

I have already mentioned the Opuntia which the Doctor found serenely growing upon the tip-top of a large giant cactus, and promptly pictured for the general good. Of course it sprang from a seed that was carried to that high point by some bird, and by a combination of fortuitous circumstances successfully germinated. And what a fine opportunity it offers for a nature-fakir's marvel!

We saw many interesting cacti of small size, singly and in clusters, but it is difficult to transfer that interest to a printed page, in reasonable limits. Of greater interest than they were the All-Thorn Bushes with large, fleshy stems for the storage of water, and many thorns but no leaves. This very queer plant is well shown in Mr. Phillips's photograph—a cubic yard of naked stems and angles.

Many of the desert plants have developed large, soft stems for the quick receipt and long storage of water by which to sustain life during the long and dreary hot months

of summer, when the rainfall is reduced to an irreducible minimum. The thick-stemmed shrubs offer of themselves alone an interesting study—abundant food for thought, but none for stomachs of flesh and blood; for they are mostly so bitter and pungent that no animal can eat them.

CHAPTER XVII

A JOURNEY OVER THE LAVA AND ANOTHER TO THE GULF

Work on Specimens—Arroyos—Awful Lava Ridges and Lava Plains—Mutiny in the Line—The Gulf of California—Two Antelopes Killed on a Lava Plain—The Highway to Pinacate—The Tule Tanks, *Sans* Tules—Our Camp—Mr. Sykes Goes to the Gulf.

THE day after the trip to the Sykes Crater, and the bringing in of the sheep, was for me a busy one. The complete skin of the big ram was made up for the Carnegie Museum; there were three heads to skin and sheep meat to cure to the limit of half the visible supply. The Boys gathered lava boulders and built for me, against the foot of the steep lava hill, a fine standing-up table on which I could work to excellent advantage. Since the advent of the grim spectre called Mastoiditis, there is for me no more working on the lap of Mother Earth.

I am very partial to a permanent camp, around which one can gyrate and explore galore, with a new programme for each day. We would blithely have remained at the Papago Tanks for a week, exploring their environs, but were denied that pastoral pleasure. Pinacate Peak was still ten miles away, over a terribly rough course, and on the direct course there was not a suspicion of water between. We were therefore compelled, like the Wandering

Jew, to move on; and after a long, hard day on those specimens we made up a light pack train the next morning and moved out. We left behind us Jess Jenkins, George Saunders and all those infernal dogs.

Charlie Foster had been told by a Papago Indian that there was a lava water-hole, or "tank," somewhere to the westward of Pinacate Peak, and that by going down to a certain group of granite mountains at the edge of the sand-hills, and tacking back again over an old Indian trail, we might find it. The distance over that V-shaped course might be fifteen miles, or it might be twenty. And so, with unspoken reluctance, we mounted our horses, drove out the pack animals and set forth on what we hoped would be our last circumpolar march.

Instead of going south-eastward toward Pinacate, we headed *due south*—always and everlastingly away from our goal! But as usual, no one said aught against it—until later.

After leaving the Papago Tanks, the Papago arroyo, or barranca—whichever name may be preferred—rapidly widened into a bed of loose sand as wide as the Sonoyta River at the Santo Domingo crossing. Its low and level banks were covered with dense jungle of the standard sort, which surely would have contained deer but for the Papagoes of lang syne. Finally, however, we left that comfortable valley and climbed over a huge ridge of lava so upheaved, so contorted and so awful as to baffle both camera and description. Neither can do it justice, any more than a lens can catch and record the spirit of a mean man. An old, disused trail led along our way, without

which we surely would have had a purple time of it getting over that unparalleled roughness.

There were hills and valleys a-many, of piled-up hell-fire suddenly grown cold. The lava glowered and scowled at the heavens and dared us to come on. In places it was red, but mostly it was shiny Vandyke-brown. In places, great ragged slabs of sheet-lava *stood on edge*. Our horses gingerly picked their way through it and over it, taking excellent care to stick closely to the trail. In the worst of the lava there was practically no vegetation—just blasted ridges, ragged hollows and cinder-covered hills at which wild-animal life draws the line.

In the midst of the most awful of those lavascapes I halted and tried to secure a sample picture; but the result is unavailable. The photograph shows only a fearful jumble of chaotic details, black and terrible, but inadequate.

After leaving that blasted region, we emerged upon a great lava plain six or seven miles in width, over which our progress was much easier. The character of it is well shown in the picture of Mr. Jeff Milton and his antelope. Presently, we sighted a group of very sharp, saw-tooth granite mountains at the edge of the sand-hills, dead ahead.

We rode, and rode, and rode; steadily going away from our mountain goal. At last the situation became intolerable; and being near the rear of the column, to help drive the sorrel pack-mule, I halted for Mr. Sykes to come up.

"Mr. Sykes, do you know how much farther we are likely to go in this direction?"

From a photograph by J. M. Phillips

Into the Lava Field by Pack Train

"Charlie says the trail leads around that group of mountains, ahead of us."

"Heavens! Is it possible! We will then be several miles farther from Pinacate than we now are, and *no better off!*"

Then Mr. Sykes burst forth—a sunburned human volcano.

"It's the most idiotic way to get to a mountain that I ever saw anybody take. *I* think that the way to get to a mountain is to *go to it*, not *away* from it!

"The course we are steering is getting on my nerves. There is nothing to hinder our crossing this plain in any direction we choose. Yonder is a good, broad highway leading straight to the top of Pinacate; and there must be water in that valley, somewhere. Let's ride up and speak to the Doctor."

The spirit of rank mutiny which thus reared its head ran along the line until it overtook Dr. MacDougal. Up to that moment none of us ever had offered even a suggestion regarding our routes and camps.

"Doctor, why is Charlie leading us this long goose-chase down to the sand-hills and away from Pinacate, when we can just as well make a cut-off, straight toward it?"

"I've been wondering about that myself," said the Doctor, promptly. Then he raised the voice of authority. "Hello! Charlie! We're not going any farther on this trail. It's taking us where we don't want to go. Lead off here to the left and let's go toward Pinacate instead of away from it!"

"But with no trail," said Charlie, "maybe no find Tule Tanks! Quien sabe?"*

"We'll take our chances on finding water somewhere before night," answered the Doctor, resolutely.

"Bueno," said Charlie, quietly and respectfully; and as he led off sharply to the left, we once more rode toward our goal, instead of away from it. We were then due north-west of the mountain. Instead of describing a letter V to reach our goal, with its nose in the sand-hills and miles out of our way, we turned it into a capital A, and started to traverse the cross-bar.

Our average altitude must then have been about one hundred feet above sea level. All about us was the black-brown lava plain, in general not at all bad to travel over by picking one's way, but cut by numerous lava-rock gulleys, and occasional ridges of the roughest lava on earth. There was not a pound of earth visible anywhere, but on the plains the lava had decomposed sufficiently to form a good solid bed of reasonable smoothness, which I suppose is fairly entitled to rank as earth. Of sand there was so very little that I remember none whatever. On those lava plains, as we may rightly call them, the particles of lava often resemble coarse gravel, thinly strewn; but these areas are always surrounded by beds of coarser material, like furnace coal six inches deep, over which horses make their way with difficulty.

Looking westward, off our starboard quarter as it were, the lava plains went undulating down for three or four miles to where they met the littoral sand-hills, and

*Pronounced "keen sav'vy"; meaning "who knows?"

ended very abruptly. The waves of clean, yellow sand rolled westward for ten miles farther, and beyond that fearful shore glistened the placid waters of the Gulf of California. We were directly opposite the most eastern point of Adair Bay. Across the Gulf, seventy miles away, loomed up a huge and lofty mountain mass, called by so many different names that it is difficult to pick the winner. Dr. MacDougal and Mr. Sykes say that its eastern face is a perpendicular wall that for miles and miles at a stretch is unscalable, even for a man on foot. During the whole of our stay in the region due west of Pinacate, the panorama of the Gulf and Adair Bay was ever spread before us—a sheet of frosted silver fading away into horizon haze.

Once while our sinuous serpent of horsemen and pack animals wound its way along a smooth lava ridge, the leaders suddenly halted and fell back in some confusion.

"Antelope! A bunch of antelope!" said Mr. Milton, visibly agitated. "Over there, on the other side of that arroyo!"

"Go quickly, Doctor!" we said to our leader.

Flinging himself off his horse, and bidding Frank Coles come with him, Dr. MacDougal lost not a moment in stalking the animals. There were five of them, a quarter of a mile away, on the farther side of a ragged ravine of lava thinly sprinkled with desert trees.

But the antelopes were very wide awake; and not liking the looks of our party, they ran, long before the leader came within shooting distance. Even before they started, however, Charlie Foster went on record with a contribution of hunter's wisdom. He said to Mr. Milton,

"Go on ahead! They cross ahead—over there—and maybe you can shoot."

Mr. Milton instantly acted on this hint, and as the animals started to run he galloped straight forward on our course. On the nose of our ridge he dismounted and ran forward, rifle in hand.

True to Charlie's prediction, the prong-horn band circled, and finally halted within gunshot. Mr. Milton fired twice in quick succession, and killed both the bucks of the bunch, neatly and thoroughly.

Naturally, we examined the trophies with keen interest. Their horns of 1907 had been shed about two months previously (let us say between September 15th and October 1st), and the new editions were still quite immature. The prongs were but slightly developed, and the hair still covered the lower half of each horn. It should be stated here that on no other animal is the conversion of hair (the true horn material) into horn so visibly manifest as on a new horn of *Antilocapra*. In one good look you can see the whole process.

One of those bucks had a mane that had developed as a queer little semicircular crest of reddish hair, standing two inches high by about six inches long on the base. But it was not repeated on the other male antelopes that were killed on the trip, and it must be noted as an individual character only.

We were greatly pressed for time, because our future was so uncertain, and we dared not linger over those specimens. It was impossible to carry them with us while we searched for water, so we chose the best specimen,

From a photograph by J. M. Phillips

Mr. Milton Kills Two Antelopes on the Lava

From a photograph by J. M. Phillips

Mr. Sykes and the Carnegie Ram on the Red Lava Peak

quickly measured and eviscerated it, then hung it as high as we possibly could in a stout mesquite tree that grew in the arroyo near by. We said we would "send back after it"; but in my mind I bade it farewell, for it seemed almost impossible that we ever should see it again. Mr. Sykes asked for the head of No. 2, which was promptly allotted to him. While he cut off the specimen, the rest of us took the hind-quarters for meat, and ten minutes later we were again on our way.

Straight toward mysterious, elusive old Pinacate, *at last;* and not so very far away! Leading directly from us to the top of the mountain there lay a broad, valley-like depression, seemingly half a mile wide, which was entirely free from lava peaks, and looked like our Highway. I could not call it anything else than that—but Heaven help any wheels that ever try to traverse it! They will wish they had never been born.

On both sides of the highway volcanic peaks and lofty ridges are massed up. The open sweep upward ends abruptly in a narrow notch, beyond which is a valley of unknown depth and width. Beyond that rises two peaks, and it is plain that the one toward the north is *the* peak of Pinacate.

An hour before sunset we came to a very deep arroyo, cut down through the lava field, thirty feet sheer; and it lay across our course. It came from higher up on Pinacate and went south-westward. Almost at the very point where we struck it, we found—the Tule Tanks! And right there we camped, properly thankful for our luck. "Tule" is pronounced tu' lee, and it means "marsh";

but at that point we seemed very far removed from all marshes.

It was a wild spot for a camp—out in the open, no landmark near it, and difficult to find. Luckily I took good care to note its bearings with reference to the nearest peaks, and once later on we found the camp when otherwise it might easily have been lost in the darkness and we might have been compelled to "lie out" all night.

On reaching the tanks we found them full of water, lying at the foot of a thirty-foot wall of rock, up which we hauled our camp water in a canvas pail, at the end of a lariat. We unsaddled with all haste, and when all was clear Mr. Milton and Charlie took the whole bunch of horses and started toward the sand-hills, to look for galleta grass. We were on the anxious seat until they returned, two hours later, with the news that they had "found grass that would do," and set the herd into it. After that we settled down contentedly to develop the Future to its utmost limits.

Several times while in that camp I was impressed by the puny insignificance of our party in comparison with the great manifestation of Nature around us. Everything was on a scale so grand and awful that our personality as a party did not seem to amount to shucks. So far as Nature was concerned, we seemed about as important as so many jack-rabbits, but not much more. Our camp "cut no figure" whatever. When returning to it we never could see it until we were almost ready to fall over it.

Had we not found water in that arroyo, or near it, we would have camped dry until morning, then fled back

to the nearest liquid, with all possible haste. Had we not found it, we would have "busted Pinacate" just the same; but we would have had a mighty lively time carrying in water on our pack-horses, and doling it out by metre until our ends had been accomplished. The supply for ourselves would have been manageable, but with horses, every water-carrier is a serious problem on account of the large supply absolutely needed for him. And so, again I say to all those who may be tempted to view Lavaland from the top of Pinacate—be sure you are right about your water supply, then go ahead. Remember that, for the average white man of the North, thirty-six hours without water is about the living limit.

Naturally, we speculated much on the proposed trip across the sand-hills to the waters of the Gulf of California. At first we all intended to make the trip; and it was fully conceded that it must, perforce, be made on foot. But as the sands of our time-limit rapidly ran out, and we counted up the available days remaining, my mind was quickly made up. I broke the news to the Leader, very gently, in this wise:

"Doctor," I said, "for me, the shore of the Gulf at this particular point has few zoological attractions. The shore is marshy; it would take a day to reach it, and a day to return, carrying everything on our backs. For me, the results would be meagre. If I may be excused, I think I will watch the rest of you make the journey *while I hunt mountain sheep.*"

The expected happened. The bare idea of giving up two glorious days of mountain-sheep hunting for a hot and

tiresome tramp through ten miles of loose sand, to a muddy old foreshore with nothing upon it, was too much. Gulf Coast stock dropped eighty points, with a hard thud. But the Doctor protested that he *did* want to see the botanical features of those sand-hills; and Mr. Phillips vowed that he *must* have a bath in the Gulf. Mr. Sykes said,

"Well, I simply *must* go, to test my aneroid at sea level, in order to get my elevations correct. For me, there really is no option."

In the end, the Geographer was the only man who went; and the rest of us spent our time in other pursuits. One night, at tea-time, Mr. Sykes was totally missing. No one had seen him since morning, when he was observed running loose on the lava field toward the west, dragging his lariat. When late bedtime (eight o'clock) came without bringing him, some Wise One exclaimed,

"I'll bet anything he's gone to the Gulf!"

And sure enough, he had! About one o'clock that afternoon, while wandering over the lava, mapping and measuring peaks, he said to himself, in genuine English style,

"It's a fine day; I'll go to the Gulf this afternoon!"

Without further parley, or a word to any one, off he started. He tramped that whole round trip, eight miles of it on lava and ten miles in loose sand, in about thirteen hours. It was about half-past one in the morning when he jauntily tramped up to camp, helped himself to some fragments of cooked food that the rest of us had carelessly overlooked, and slipped into his sleeping-bag.

The next morning he rose with the rest of us, as lively and debonair as any of us, and quite as ready for the

From a photograph by J. M. Phillips

The Lava Field and Our Camp at the Tule Tank

View looking northeast

doings of the day. This is what he told us about his trip and its results:

"When I left camp yesterday morning, I went over to the big lava butte to the west, climbed it and took a lot of sights, and then, as it was still early, I thought I would go down to sea level with my aneroid, so as to get a check on my readings on Pinacate. From the top of my butte I picked out what looked to be a fairly easy route across the sand-hills, set my pedometer and started. My selected route first led me diagonally across the playas toward the sand, then more or less of a zigzag course through the sand-hills, and after that straight for the shore of the Gulf. I estimated my distance from the shore-line to be from fifteen to twenty miles, and this proved to be fairly correct; for from the time of leaving the top of the butte until I got back into camp, my pedometer tallied forty-three miles.

"The sand-hills averaged about five miles across, and in them the walking is very bad. The Gulf front of these hills is a clear-cut line, and the highest dunes are close to this eastern edge.

"Once through the sand, my course lay straight across some galleta grass flats toward some bare-looking saladas that I could see from the tops of the dunes. The walking was now very good, and by sundown I was probably two-thirds of the way from the sand to the shore. The full moon rose over Pinacate about dusk, and so I had plenty of light.

"I soon reached the tide flats, got down as far as salt water, corrected the scale of my aneroid and started back to camp. I had determined to make, on my way back, a

détour toward the south, through the sand-hills, as my last sight in that direction from the frontal dune had shown me a better route than the one I had followed in going toward the shore.

"I got through without any difficulty, steering by the ten stars, and as I had a latch-key to my own particular sleeping-rock at the Tule Tanks, I knew that none of you would be sitting up waiting for me. I must say, however, that you all had disgustingly hearty appetites at supper, for there was mighty little left to eat.

"The net zoological result of my pasear was a few little birds of unknown species, a jack-rabbit or two, one coyote and a little coiled-up rattlesnake evidently suffering from the chilly night air. I put my hand on the snake, thinking it was a shell, and never discovered what kind of snake it was until, as he slid through my fingers, I felt his rattles! At that I bid him a hurried adieu and left him to find warmer quarters.

"The coastal plain beyond the sand is wonderfully level and covered with fine galleta grass, except on the saladas. The line of sand-hills stretches away in what seems to be an unbroken line, as far as one can see, both north and south."

Mr. Sykes collected at tide-water, and brought back to me the following shells:

Murex (Phyllonotus) becki. Phil.
Arca pacifica. Sow.
Pectunculus gigantea. Rve.
Cardium (Trachycardium) procerum. Sow.
Ostrea lurida. Carpenter.

From a photograph by J. M. Phillips

The Tule Tank

Deep down in an arroyo of clean lava rock

CHAPTER XVIII

A GREAT DAY WITH SHEEP ON PINACATE

A Scattered Party—The Distant "Cut Bank"—View from 1,000 Feet Elevation—A Lost Aneroid and a Maze of Coat-pockets—The Choya Peak—Hard Travelling for Human Feet—Two Sheep Sighted—A Run for Them—Bad Shooting and a Badly Rattled Sportsman—Mr. Phillips Apologizes for Killing His "Bunger"—Chase of a Wounded Ram—Success at Last—Moonrise Over Pinacate Peaks—The Lava Field by Moonlight.

THE nineteenth of November was a day of many sensations. As I look back upon it, it is fairly impossible to decide whether I should feel deeply mortified or highly amused by the folly of the main performance. The Reader will cheerfully decide that point.

The Leader, Mr. Phillips and I unanimously decided that the day should be devoted to hunting mountain sheep. The fact that neither the Botanist nor the Zoologist had yet scored on a "borego" was irritating to the nerves of the camp, and we decided that we must immediately allay the annoyance of hope deferred.

Mr. Milton early announced his intention to go to the horse herd, and re-locate it on better grass; and since he could not accompany any of us, we then decided, as one man, that Charlie Foster should improve the shining hour by going back after the dead antelope—precisely in the

opposite direction from our sheep hunting. That would keep him out of mischief for the day, and we would be free to hunt sheep all alone. Dr. MacDougal invited Frank Coles to accompany him, and they set off south-eastward from camp, on the south side of the Highway.

Left to our own devices, Mr. Phillips and I decided to go up the Highway straight toward what seemed like a lofty, triangular cut bank, of a decided red colour, a little to the north of the Highway. We had some curiosity about that "cut bank," but immediately beyond it there rose a collection of peaks which we felt might contain sheep, provided any *Ovis* inhabited the middle slopes of Pinacate.

A three-mile tramp across a very interesting lava plain brought us to an isolated extinct volcano which rose a little to the northward of our course; and as in duty bound we called upon it. It was very imposing, very rough and admirably adapted to the wants of sheep, but no sheep were there; so on we tramped toward our "cut bank."

On a commanding ridge we sat down with our backs against some angular chunks of red lava, to rest our feet and scan the cones with our glasses. Mr. Phillips took out his fine new aneroid barometer, to ascertain the elevation, and it happened to be, as nearly as possible, 1,000 feet. We feasted our eyes on Adair Bay and the Gulf, on the sand-hills, the granite mountains far away westward and the miles upon miles of lava, then pulled ourselves together to resume our quest. As we rose, Mr. Phillips replaced his aneroid in one of the many pockets

of his sleeveless hunting coat—pocket No. 17, he said later on—and his field-glasses were cached in No. 9.

Now that hunting coat was a wonder, purchased in Tucson, at the suggestion of our Leader—whose only fault lies in the possession and use of one on the deserts. In looks that garment is a tailor's atrocity, no less. Mr. Phillips's edition had twenty-three pockets (I think that is the correct number), around, beneath and on high. The whole outer surface of the garment, from the collar down, was completely undermined by them, and had they only been connected, like the underground chambers of the kangaroo rat, they would have made an impregnable system. The coat was a wonder, because when once you had deposited something in one of its pockets, you were kept wondering where it was, and whether you ever would find it again. It was a disreputable coat to look at, because its armholes were much too large and entirely too low, and too much of it hung below the equator of the wearer.

Half a mile beyond our resting place, Mr. Phillips began to look for his aneroid once more, in anticipation of using it later on. He always began to hunt for things about a quarter of an hour before using them.

"I know I put that thing in No. 17," he said at last, in an aggrieved tone, "but it isn't there."

"Go on," I said, "Hunt for it! You've got it, somewhere."

He had not explored more than half of them, but the search that he made through that maze of pockets made me dizzy. Finally he said, wearily,

"I can't find it. But I may have missed some of them. . . . See if you can find it."

I went through those pockets, in and out, over and under, playing hide and seek until my head swam; but no aneroid was found.

"I'm afraid I've lost it," said John.

"Well, if you have, we can find it in fifteen minutes. Let's search for it on the lava."

We hunted, high and low, both near and far. I thought I could find it in ten minutes, but we found it not at all; and after losing a precious half-hour or more, we had to give it up. John M. was greatly annoyed; but even to this day I do not sorrow as one who has no hope. I believe that aneroid will yet be found in one of the burrows of that multipocket coat.

At last we reached our supposed cut bank, and it turned out to be a perfect cone of ashes and fine red lava. It is about seven hundred feet in height from its base; but not for worlds would I climb to its top to measure it. From bottom to top it is completely infested with Bigelow's accursed choya, thousands of them, sprinkled all over those steep sides and standing so thickly that a man can scarcely pass between them. As you look up the mountain side toward the sun, the light shining through those millions of clear, white spines gives the slope a frosted appearance. Almost invariably they are low growers, seldom being more than knee high; and the fine, loose lava seems to encourage their reproduction.

It being in our route, we started to make a cut-off across the northern foot of the Choya Cone, but it was

impossible to get on without occasionally ploughing down through the loose material, against our will.

"Here," said Mr. Phillips; "this won't do! We must get off here before we have a slip, and come to grief on these choyas. We're here to hunt sheep, not to pull cactus spines out of each other."

At once we turned abruptly down hill and got off the side of that dangerous cone by the shortest route.

It was here that we entered the roughest, wildest and most awfully unheaved volcanic region that we saw on the trip. There was a bewildering maze of deep valleys, high ridges, mounds and mountains, all of them covered with the roughest lava to be found anywhere under the sun. Every square yard of it was horrible. There were dozens of ravines which no horse could cross, even under an empty saddle, with a rider on foot to lead the way. The slightest fall in that stuff would cut a man's knees and hands most cruelly. While our horse-hide shoes with flexible soles took us over the lava without any slipping, the roughness of it wrenched and strained our feet and ankles severely. A man with big, strong feet had a decided advantage over a small-hoofed individual.

Once I stepped heavily with the half-protected arch of my foot squarely across a sharp edge of lava that was like a spade sticking up; and it hurt me keenly. The sharp pain of the impact was nothing to heed particularly at that moment, but unluckily it remained with me all that day, and during the next ten miles of travel it was a great nuisance.

But it was a glorious day. As we gingerly picked our

way forward, we looked back many times at the panorama spread out below. Presently we reached what we were sure was an elevation of two thousand feet (which was right), and the bird's-eye view of the lava-field and its surroundings became genuinely fascinating. It was all so weird and uncanny we could not keep our eyes from it for long at a time. As we ascended, the strip of sand-hills became narrower and narrower, and the glassy waters of the Gulf seemed to come nearer. Our camp spot was completely lost. It was impossible to locate it, save in general terms.

We hunted carefully, but saw no sheep, nor signs of sheep. For hours we had been steadily working into the heart of the roughest lava mountains in sight—and quite rough enough they were, too! At last we began to fear that in coming into such a blasted place we had overdone the situation; for why should mountain sheep, that usually love luxury, choose to live in such a petrified hell as that? So we both said,

"Let's go on to yonder red peak, and if we don't find sheep by that time, we may as well look elsewhere."

We toiled painfully up the side of a great ridge, and as we reached its summit we scanned the new prospect with a sheep-hunter's usual caution. I chanced to be in the lead. The farther side of the ridge dropped to a considerable valley, which ran down rather steeply for a quarter of a mile to our right, where it joined another valley that came down at right angles from somewhere higher up. As we paused behind a stunted mesquite, hunting just as carefully as if there were a hundred sheep

From a photograph by J. M. Phillips

The Lava where the Rattled Ram Fell,

Decorated with white brittle-bushes

within range, our eyes swept the lava valley in front of us, from its head to its lower end. And *then* I saw two somethings—as big as cattle—so they seemed.

"Look yonder! Two sheep! Rams, both of them! Merciful powers! Look at that head of horns!"

That was the only time in my life that I ever said "head of horns"; but that head seemed to be *all horns!* As the leader of the two rams walked slowly into the other valley and disappeared behind the nose of the opposite ridge, he held his head low, as if his horns were so heavy that he could scarcely carry them.

We crouched behind our bush until the sheep were out of sight; then we did things. We saw that we had to run down our ridge and up the next one—a good half mile in all—to reach a point from which we might hope to see the rams again, and within rifle-shot. With unblushing effrontery, I took off the party canteen, half filled with water, and without a word handed it to John. Without even a wink of protest he put it on, over his camera. Then, feeling that it was my bounden duty to kill one of those rams and thereby relieve the tension of the party, I set off down the ridge-side as hard as I could run, with Mr. Phillips close behind.

We went down that ridge without a tumble, and at full speed raced up the other. That was my only creditable performance, in that I did not fall down and break something. In what was really very quick time, we covered that half mile and reached the top of the ridge below which we expected to find the two old "bungers." It was right there that the mistakes of Moses began.

I was out of breath, and entirely too confident. Feeling that we had a "cinch" on those sheep, and that they were just the same as skinned and hung up, my advance over the top was too rapid and incautious. For one thing, I feared that they might be already far beyond us. Hurriedly I overlooked the visible portions of the valley of big lava chunks and scattering mesquite bushes, but saw not the sheep. Scanning everything in sight, and fully expecting to see the sheep before they saw me, I advanced over the top of the ridge. Mr. Phillips saw one of the sheep behind a mesquite bush, down at the bottom of the valley, looking up at us, and he tried hard to tell me; but I was so crazy to locate the animals that I did not hear a sound.

Opposite us, and beyond the sheep-infested valley, there arose a red volcanic peak to a height of some hundreds of feet. The side facing us was very steep indeed, and off a little way to the right it terminated in a sharp nose around which we could not see.

My first sight of a sheep was when one of the rams suddenly appeared across the ravine on the side of that peak, and in mad flight. It was a good two hundred yards away, and the sight almost gave me a horrible chill. The animal was not the ram with the heavy horns—though his horns were plenty big enough "to satisfy the taste of the most fastidious"—and to my horror he went leaping away from me, *diagonally*, and also *upward!*

Instantly I fired at him, and overshot. Mr. Phillips cried, "Lower! You're overshooting!" Again, and the bullet cut up dust beyond him. Again! There was no

dust raised by the ball, but he did not *show* that he was hit. My thoughts were all on one line, thus:

"Quick! *quick*, or he will get around that point and be lost forever! *Hurry!*"

Just then there was a rush of a dark object coming tearing over the lava from the left and below, straight toward us. One glance showed that it was the other ram, coming like a steam-engine!

"*Here he comes!*" yelled John, fifty feet to my right, in a tone of stern command. "SHOOT *him!* SHOOT *him!*"

With my eyes fast fixed on my own fast-vanishing ram, I threw a cartridge into the magazine of my Savage, and as the big ram rushed by only forty *feet* away, my muscles obediently pointed my rifle toward the animal. *Without taking the slightest aim*—with both mind and eyes firmly fixed upon my own escaping ram—I pulled the trigger. I never touched a hair of the ram—and afterward could scarcely believe that I had fired in his direction. It was not *my* ram, in any event; and my whole thought had been that I had no *right* to shoot at him!

An instant later Mr. Phillips's big rifle roared out at the ram, full into its vitals, as it passed him only twenty yards to his right, and "biff!" went the horns of the ram into the side of a niche in an upright rock, twenty paces farther on. With the crash of the impact the splendid animal fell stone dead. Then Mr. Phillips whirled to me and said, in a tone of deep regret and apology,

"Oh! I *beg* your pardon, Director! I *didn't mean* to do that! *Please excuse me!*"

I could have shouted with laughter at the glorious absurdity of that speech. It was too funny for anything but roars; but I had not even one second in which to enjoy a laugh at that time. My running ram was almost to the vanishing point, and going as well as ever.

For what I knew was my last shot, I steadied myself, took more deliberate and careful aim, and let go. No visible result; and the next instant the sheep turned the corner and disappeared.

The awful mess that I had made of a perfectly golden opportunity, and the horrible exhibition that I had made of myself, almost made me sick. I think that was the worst thing that I ever did in hunting; and that is saying much. But I resolved to do my best toward looking further for that ram. So I said, humbly,

"I am going to circle round the base of that peak and see if I can find that ram again."

"Your second shot hit him, all right," said Mr. Phillips, "and it was bully good shooting—at that ram bouncing diagonally up those stairs. Your last shot was at four hundred yards. I'll go up yonder and take his trail and see what I can do."

"Well, don't fall off that steep place, ram or no ram."

We separated, and in a miserable frame of mind I swung off lower down, to encircle the base of the peak. The lava was bad as the worst, and my progress was maddeningly slow. I had really no hope of ever again seeing that ram, unless I found him dead.

After an interval, I saw Mr. Phillips gingerly working

From a photograph by J. M. Phillips

The Author's First Ram, and Its Lava Surroundings

his way along the dangerous face of that steep pitch, and at last he called softly, from quite high up,

"There's blood here! You hit him!"

I pushed on over the lava, faster than before, and actually made my big circuit faster than my comrade was able to make his small one on that dangerous slope. I had swung around nearly a mile in order to reach a spot such as the ram would naturally choose to lie down in if he were badly wounded. I was about two hundred feet lower down than the vanishing point. At last I started to climb up into the heart of the place where the sheep might well be if he were wounded and had not got clear away—and then I was fairly electrified by seeing the ram's head suddenly appear above me, and look down at me. The next instant, however, he vanished.

I went up that lava pile at a run, and soon stood where the ram had been. He was nowhere in sight, but a great patch of blood-spatters showed where he had stood for some minutes. Eagerly my eyes devoured every object in sight. The ram might have gone any one of three or four ways; but I felt that in the end I would get him. Then I heard a voice, as if from Heaven, calling out from away up on the peak,

"To the right! To the *right!*"

I whirled and dashed off that way at top speed, and ran straight toward the sheep. He was just climbing up the ragged side of a deep ravine of lava about seventy-five yards wide at the top. As he reached the top I was quite ready for him, and planted my one good shot.

He fell over like a bag of wheat, tumbled slowly down

the wall of ragged lava, and half way down lodged fast, hanging head downward. The chase was done; but the less said about the manner of it the better. I did, however, shout the news to John M., who stood on his red peak, swung his Stetson sombrero and yelled his congratulations.

I saw at once that although my ram was not the one of the long horns, his horns had extraordinary basal circumference. I measured them as best I could alone, and made them *seventeen inches*, subject to errors. Later on at camp, with two men to help me, I measured them accurately, and found that they really were seventeen inches, precisely; but their size was all in the base.

Our two rams fell about a mile apart, on the foot of the north-westerly peak of the group that forms the culmination of Pinacate. The elevation was about 2,500 feet. Mine lay in the head of a deep lava ravine about five hundred feet down from its source. A very short distance above it, in the side of the perpendicular wall, there was a neatly sculptured niche, six feet high and five feet deep, with an arched top, precisely like a niche for a marble statue. Near it stood, like a sentinel, a brave but solitary giant cactus, dwarfed to six-foot stem, but indomitable!

I scrambled up to the niche and, quite as I expected, found that it was a mountain-sheep bed of long standing. By the appearance of the floor, many a ram had rested there, and I opine that many more will enjoy that odd nook hereafter.

We were then about six miles from the Tule Tank, and about three miles from the summit of Pinacate.

From a photograph by J. M. Phillips.

The Sheep Bed in the Lava Niche, and the Sentinel Cactus

The lava is garnished with White Brittle-Bushes.

Many times that day the summit looked very near and tempting, and but for the fact that we could not think of forestalling the Doctor and Mr. Sykes, we would have made a rush for the top as soon as our sheep were dead, regardless of getting back to camp. But the measuring, the photographing and the dressing of the carcasses occupied much more time than we thought, and before we were fairly aware of it the short afternoon was almost done. At the last moment we made haste to start back while daylight remained; but alas! we soon found that we had wasted the shining hours.

After piling chunks of lava around the heads of our sheep—a most wise precaution, as it proved—we drew a bee-line down the Highway for camp, leaving the Choya Peak on our right. The upper two miles were so rough and bad that we were an hour in winning over them. Then the sun swiftly sank behind the far-distant crest of the Peninsula of Lower California, and darkness followed with unseemly haste.

By that time my feet were actually crying out in protest against the punishment that was put upon them. The soles of my shoes were too soft! My ankles were weary of being wrenched all ways about, the soles of my feet were as sore as if I had been bastinadoed, and my injured instep hurt me exquisitely at every step. During that six miles to camp I endured much, and my gait was hobbling, not walking. I was indeed a "tenderfoot"; but there was absolutely naught to do save to bear it, and go on.

When about half way to camp a glorious diversion appeared. A full moon of unusual brightness rose pre-

cisely between the two highest peaks of Pinacate and flooded the black waste of lava with most soothing, mellow light. By a common impulse, we paused and faced eastward, to revel in the new and beautiful aspect of Nature. Under its beatific influence all such sordid things as lame feet were quickly forgotten, and from that moment the tramp to camp became a moonlight sonata.

The mountain mass was a black silhouette, outlined above in old gold. From the distant summit a golden pathway came down across the lava, as if specially ordered to light our rugged course. We walked upon our shadows. The tops of the nodules of hard lava near at hand glistened in the yellow moonlight as if gilded, and the radiance melted away in the distance with intangible softness. When we came within half a mile of the red lava-cone of the morning, it was plainly visible. Far beyond our camp the dark mass of another lava peak was distinguishable, and between the two we were able to steer our course so accurately that we hit camp very fairly.

On reaching the grand arroyo of the Tule Tank, we shouted, and were quickly answered. Soon the smouldering camp-fire was kindled into a blaze, by means of which we cautiously picked our way to the only practicable crossing, crept down the wall with outrageous care and soon reached the comforting precincts of Home. There was warm food in the Dutch oven, which we gladly considered. Faithful Frank Coles said that they had delayed supper for us and burned up no end of wood on the camp-fire, to guide us in; but the latter we saw not. Dr. MacDougal and Coles had found a large ram, but it saw them

first and gave them not one fair shot. It went away over the lava plain with a broken leg, and after tracking the animal about four miles—most skilfully on the part of Coles, so said the Doctor—night put an end to the chase for that day.

CHAPTER XIX

THE ASCENT OF PINACATE

By Saddle-Horse to the Foot of the Peaks—Weakness of the Camera on the Lava Beds—The Notch—Mountain Sheep—Pinacate Peak, at Last—More Mountain Sheep—A Fearless Band, and a Great View of It—General Aspect of the Peak—A Great Extinct Crater—The Climb to the Summit—A Wild Revel on the Top—The Cyclorama Below—The Sad End of the Sonoyta River—"The Big Red Peak"—A Circle of Photographs—Our Cairn and Record—The Doctor Gets His Sheep—The Flight from the Summit—Three Decide to "Lie Out" Near the Two Rams.

THE twentieth of November dawned gloriously from Pinacate down across the lava to the open bivouac where half a dozen tired men lay sleeping above the Tule Tank. The morning temperature was 43° F. Late on the night previous we had gone to our sleeping-bags half dead of sheer weariness, and feeling like old men. Doctor MacDougal and Coles had chased a ram for four long miles over the lava, until sunset drove them from the trail. Mr. Phillips and I had hunted within three miles of The Peak, ruthlessly bagged two fine rams, then tramped in after dark, quite tired out. Mr. Sykes said afterward that we had covered about fourteen miles; and had I only known that, as we hobbled home over the lava, I would have felt even more sorry for my feet than I did. Mr. Sykes had

From a photograph by J. M. Phillips

View of Pinacate across the Lava Field, from the Tule Tank

made his wild-goose chase to the Gulf of California *and back*, getting in at one-thirty in the morning.

By good rights we should have lain a-bag about twenty-four hours, in order to square physical accounts with the previous day. But no! With the first burst of daylight every man "piled out" into the crisp air and began to dress as blithely as if fatigue were a thing unknown. There is nothing in the human economy more wonderful than the recuperative power of a man who ardently desires to do something, and lets whiskey alone.

That twentieth of November promised to be the greatest day of the trip; for by universal consent it was dedicated to the final assault on the main peak of Pinacate. It was The Day to which for eight months we had steadily been looking forward. The mountain sheep were, in comparison, but a mere incident. After two full weeks of swinging around that pivot peak, in which we described a semicircle with a fifteen-mile radius from due east of Pinacate to due west thereof, we were at last ready to charge straight forward to the summit, and solve the last section of the mystery.

I wish that it were possible to place before the reader a pictorial exhibit of the lava beds at the Tule Tank, but it is not within my power. I am puzzled to divine the reasons why, but it is a fact that the camera seems utterly unable to grasp and transmit the details of those awful lavascapes. I think it must be due to the dark monochrome colour effect, which is quite unrelieved and unaccentuated by the many-tinted rocks, and trees, and other features that make up landscapes elsewhere. White

peaks, and peaks gray or green, are easily photographed, at all ranges, but before *black* peaks and black foot-hills the human camera gives way, completely. A stereoscopic picture, in a stereoscope, is the only one which enables the human eye to dig into the details of that great lava exhibit. We do know to a certainty, however, that all around Pinacate the atmospheric conditions for photography were unsatisfactory.

For a beginning Dr. MacDougal and Coles went off to finish trailing their wounded ram, hoping to find it early and afterward meet us on the peak. Charlie Foster was sent down to look after the horses that were grazing in the galleta grass two miles away, and with them he spent the entire day. The four remaining members of the party, Mr. Phillips, Mr. Sykes, Jeff Milton and I, elected to go together and strike straight for the summit. We planned to climb the peak, and on our way home swing around to our two dead rams and bring them in—all in one day. But, as Charlie Foster would say, "Quien sabe?" Who knows? This involved the taking of horses; and in order to make time we decided to ride as far up toward the foot of the peak as our horses could carry us.

As I folded my canvas hunting-coat—lined with corduroy—and strapped it snugly behind my saddle, Jeff Milton noticed it and exclaimed,

"Why! Are you going to take your coat along?"

"Yes!" I said, "I always make it a rule to carry it whenever I ride."

"Well, then I'm blanked if I don't take mine, too,"

said Jeff. He was as frank and open-hearted as any boy of sixteen, and utterly barren of false pride.

Had we but known all that lay before us, how quickly I would have put a blanket under my saddle. A thick saddle-pad is all right, so long as you don't have to "lay out"; but if you are caught out, you quickly realize that a saddle-*blanket* is a genuine life-saver.

Mr. Milton rode his horse and led "the sorrel mule," to pack in the mountain sheep, but Mr. Phillips elected to go on foot. We set off straight toward the peak, up The Highway which seems to have been specially cleared as a royal road from the Tule Tank up to the foot of the cone. For four or five miles the lava plain was not bad for shod horses and we got on very well; but after we passed that awful red-lava Choya Peak, on our right, the roughness of the lava and the raggedness of its ridges and ravines taxed to the utmost our ingenuity in path-finding for our horses. It was by far the worst country into which I ever took a horse, and but for the sheep to be brought out we would gladly have left our mounts at the Choya Peak. Many times we were compelled to dismount and lead our horses. Once we rode into a rugged cul-de-sac that offered no outlet for a horse, and compelled us to retrace our steps for a considerable distance.

All this time we were constantly ascending, and it seemed that the higher we climbed the wilder became the lava. Milton roundly asservated that he "wouldn't go over that stuff on foot—not for *no* money!" And when he said to me very feelingly, "No wonder you lamed your feet on this, yesterday!" it soothed both my feet and feelings.

We passed our two dead rams some distance to our left and headed straight toward the foot of the big lava peak that rises west-north-west of Pinacate. What invited us thither was a high lava plateau, half a mile square, which seemed like the best situation in which to leave our horses. The deep notch on the south of the secondary peak seemed to offer the best route to the main peak, and we decided to go through it—all but Mr. Sykes, the Geographer. He elected to separate himself from the rest of us, and take his horse with him. He rode on and upward toward the north, and presently disappeared around the steep northern shoulder of the peak, riding his old horse when he should have been leading him. But his theory was very simple. On the subject of saving horses he once said,

"Horses are cheaper than men; and there will be plenty of old horses left in Mexico after I am gone."

At the highest—and worst—point which Mr. Milton and I considered practicable for horses without punishment, we dismounted, unsaddled and tied fast to the largest mesquite bushes we could find. Forthwith we set out to climb on up into the notch, and through it.

The barrier on the south was a great hill of lava, which on the side facing us terminated in a steep wall, like a cut bank. The face of the precipice was disintegrating and blowing away. Across it ran several well-defined sheep trails, leading from below up to the summit of the hill, opposite Pinacate. They were mountain-sheep highways, for fair. As we reached the farther end of the notch, with Pinacate Peak wide open before us,

"Look there! Look there! *Six mountain sheep!*" said Mr. Milton.

And so they were; six ewes. Evidently they had gone through the notch, over their highway, only half an hour ahead of us. They were near the out-jutting nose of the hill, about seven hundred feet away and keenly alive to our presence. As we scrutinized them for a few moments they gave us stare for stare; but presently, having no protector, they decided to be going, and moved farther along.

"Pinacate at last!" cried some one, as we turned from the sheep to gaze at the cone upreared ahead of us. The rib-like thing at which we had, for two days, been looking intently with our glasses resolved itself into a high and narrow wall of naked lava, like rustic rock-work from ten to twenty feet high, which ran south-westward down a steep angle of the cone.

"The climbing is all right, boys!" cried Mr. Phillips. "We'll soon be up there. Look! Look! Yonder's Dr. MacDougal—half way up!"

Sure enough, away up there, close under the lee of the rustic-lava wall was the Botanist, briskly swinging along upward, within five hundred feet of the summit.

"Why! The south side of Pinacate is just like that awful Choya Peak that we——"

"*Great day*, gentlemen!" cried Milton. "Just *only look* at this bunch of sheep! *Nine* of 'em; and two good rams!"

Pinacate was utterly forgotten. In a most artistic group, on a very steep mountain-side that had suddenly

opened up to our view on the left, there stood nine beautiful mountain sheep, alert, but motionless as statues, intently gazing down upon us. Could we have cut out of that mountain-side a section twenty feet long by ten feet high, it would have made a fine group for a museum, without changing a line, or any adding or subtracting. The animals all stood along the mountain-side, some headed our way and some the other. The slope of the mountain was about 70 degrees.

"Look yonder! There are three more, higher up!"

"And yonder are two more—off to the right—and there are three more, lower down!"

"I see three more—that makes seventeen in all. Great Scott, fellows! Just look at that ram, standing alone on that big chunk of lava, high up!"

"I *told* you, gentlemen, that there was *worlds o' sheep* in here!" said Milton, solemnly.

"So you did, Jeff. Your sheep have made good!"

Surely there is no need to apologize for the boyish excitement that we felt during the half hour that *Ovis*, the Ram, eclipsed Pinacate, the Bug-that-Stands-on-his-Head.

We knew that the peak would remain, and the sheep would not. Everything in the world, save those sheep, was for the time forgotten. The nearest ones were within rifle-shot—about two hundred yards, no more—and the farthest were about double that distance. They had evidently been feeding during the early morning hours, and when first seen by us were quietly basking in the warm and comforting sunshine that flooded the Pinacate peaks.

From first to last those seventeen sheep manifested not the slightest fear of us! I think that they never before had seen human hunters. If the oldest ewes and rams ever had seen and fled from Papago Indian hunters, they surely had outlived the period of "that reminds me." They looked *mighty* graceful—small but sturdy legs; bodies trim, neat and well set-up; heads high and finely poised, and colours bright and clean. The wide-spreading horns of the young rams reminded me of the beautiful burrhel, or blue wild sheep, of northern India. In every line and colour they were *Ovis canadensis*—the old-fashioned big-horn of the Rockies, no more, no less. Their body colours were the typical brown, with the rump-patch and nose clean white.

As we gazed and talked, one of the nearest sheep must have said to his companions,

"Well, I'm tired of posing here for nothing. Let's lie down awhile and take it easy!"

He found a bit of ledge and calmly laid himself down upon it, to think of more pleasing things than strange animals standing upright on the lava far below and blinking upward with big, shiny eyes. About the same time, another sheep playfully reared upon another.

We decided to talk to those sheep, and said, "Hello, there! Come down this way!"

No answer.

"What did you have for breakfast?"

No sheep moved so much as an ear.

We whistled, shouted, sang and finally yelled at those seventeen sheep; but of it all they took no notice, save to

watch us very intently. We did not care to shoot any of them, and no one fired. They were too far away to photograph successfully, and we could not spare the time for an attempt to stalk within fair camera-shot. At last, after fully half an hour spent in watching the seventeen, we reluctantly started on our way. Even then they stood pat for half an hour longer and *watched us climb Pinacate!*

That mountain-sheep spectacle cost us dearly. We spent so much time upon it, and were so "rattled" by it, that Mr. Phillips and I completely forgot to photograph the Pinacate Peak from that notch—the only westerly point from which a good photograph can be taken! Between us we carried *three* cameras and plenty of films; and on our return we were still so excited by the events of the day that we never once thought of the slip until it was many miles too late to make good. John and I both deserve state's prison.

As we emerged from the notch, this is what we saw:

Directly in front of us rose, a thousand feet high above our point, the great half-cone which is the highest peak of Pinacate. Toward our right a deep notch goes plunging down toward the lower slope, and the high lava mass which comes up from the west terminates in a very steep lava-slope. Toward the north Pinacate Peak drops two hundred feet or so to a "saddle," or "dyke," which connects it with the high westward peak on which the seventeen sheep were seen. From the foot of that connecting saddle a deep ravine comes plunging down southward, and drops to oblivion far below.

With one good circular look the whole situation is

clear—at least on one important point. This huge basin between the three peaks once was the crater of this culminating volcano; and the peaks themselves when united formed the rim. First a notch was blown out toward the west, through which we came. Later on another one, much deeper, was blown out toward the south. Through those two notches ran great rivers of molten lava, and the congealed mass is there to-day, almost the same as when it came hot from the kettles of Pluto in the bowels of the earth.

Having dismissed the sheep cyclorama, we made haste to attack the peak. Dr. MacDougal had long before disappeared near the summit, and Mr. Sykes was still in obscurity somewhere toward the north.

We decided to make our climb along the south-western ridge of the peak, and after scrambling across the ravine that lay in our path, started up.

Mr. Milton was uncertain about going up. With a weight of about 225 pounds, and a very steep slope looming up, he frankly declared his doubts regarding his ability to reach the summit without hindering the rest of us unduly. Of course we insisted that he could make the climb as well as any of us, and that go he must. Mr. Phillips kept close behind him, while I did the piloting, and the first half of the climb was made in excellent order. It was steep, of course, perhaps 40 degrees—for loose lava will lie more steeply than loose limestone.

Half way up the layer of large lava blocks ran out, and we came to the rustic wall. The upper side of the wall was such a chaos of big blocks as to be impassable,

but the lower side offered excellent footing in fine lava. At that point the side of the peak fell away in a tremendous slope of fine lava garnished with Bigelow choyas, at least 40 degrees in pitch. It extended so far down that (as I now recall it) we couldn't see the bottom of it!

The steepness of that slope, and the length of it, got on the nerves of our good friend Jeff, who, be it remembered, fears nothing of flesh and blood. He eyed it askance, as a wild bronco looks at a saddle, and finally said,

"Gentlemen, I don't believe I can make it the rest of the way up. You go on, and I'll stay here."

"Oh, you're all right, Jeff," said Mr. Phillips, soothingly. "The worst of it is all over. We'll sit down and rest a bit, and then in *fifteen minutes more* we'll all be at the top!"

After a brief rest we started on, keeping close beside the lava wall, and had no trouble whatever. At the upper end of the wall we found a narrow gap, a real Fat Man's Misery, through which Mr. Milton and I squeezed. There we found Dr. MacDougal patiently and loyally waiting for us, so that we might all of us reach the summit together. And then, also, the Geographer suddenly appeared on the skyline of the saddle, northward, and while we rested he came running toward us, straight across the western face of the peak. He was bareheaded, as usual, red, and visibly excited—a new thing for him.

"I saw *eleven sheep* over there!" he panted. "I got quite close to them—and *I photographed them!* They're over there now!"

But we, also, had a tale of sheep to recount, and a tally even larger than his.

From the upper end of the wall to the summit it was a grand promenade. Each climber was generously determined that some other man should have the honour of being the first white man to set foot on the summit of Pinacate, so in order to get there we actually had to form in line and march up simultaneously, five abreast! We were all staid and orderly until we stood together on the highest point; and then a riot began.

Looking back through the vista of four whole months, and viewing things with the cold eye of a historian, I am shocked by the wild revels in which my companions indulged on that devoted summit. Before the exhibition, I would not have believed that four staid and sober men could simultaneously act so much like boys recently let loose from school. Far be it from me to set forth all the capers that they cut, or the number of times that I heard the truculent exclamation, "*Pinacate's busted!*" That expression bore reference to certain picture post-cards sent out from Tucson the day before the expedition sailed. They depicted a four-horse prairie schooner wildly careering across a desert, bearing on its wagon-cover a brazen inscription which said,

PINACATE
OR BUST!

And even unto this day do I hear occasional references to "The Busting of Pinacate."

In the midst of a solemn and even prayerful effort to

photograph, without loss of time, "the big Red Peak," I heard Mr. Sykes say, in a tone of challenge,

"Are you all ready?"

"Yes; let 'er go!" said Mr. Phillips.

"Well, here she goes!"

And then I was shocked speechless by seeing that refined English gentleman suddenly cast himself head-foremost upon the ground and actually *stand upon his head!* While a pair of No. 11 shoes, hobnailed and ancient as the sun, wildly waved in the air, Mr. Phillips cold-bloodedly focused his camera as if to take a picture. I demanded to know the meaning of that strange spectacle.

"We dared him to play Pinacate [the-bug-that-stands-on-his-head] and have his picture taken!"

But this was only a trifling incident of those goings on. No; there was not a drop in the whole outfit after we left Santo Domingo. Mr. Phillips confiscated and emptied out upon the desert a stowaway bottle of mescal that he discovered under a driver's seat, and after that there was not even a spoonful of anything. It must have been that the altitude went to their heads.

With hungry eyes we devoured the distant relief map of north-western Sonora. The very first thing that strikes anyone who stands on the summit is the big red peak that suddenly jumps up into view south-eastward in a way that is almost overwhelming. It is a perfect cone, at least 1,500 feet from base to summit, and as we saw it its colour is burnt-sienna red. It is built of fine lava, and its sides seem as smooth as if lately sand-papered. Unquestionably it is the other peak of the twins that are seen from the

From a photograph by J. M. Phillips

Carnegie Peak from the Summit of Pinacate Peak

north-east. Being quite nameless up to the date of our visit, Dr. MacDougal and Mr. Sykes have very properly christened it Carnegie Peak. It rises so near to the main peak on which we stood that its summit seemed only an eighth of a mile away. Later on, Mr. Sykes climbed it, and ascertained that its summit is two hundred feet lower than that of Pinacate.

Eagerly we turned our eyes southward, toward the wholly unknown. In that direction the view suddenly plunges downward and discloses many small volcanic cones rising like brown pustules on the lava plain far below. Our first thought was of the Sonoyta River and its ultimate fate.

Beginning at the Playa Salada, far to the north-eastward, it was possible to trace its course by the winding edge of pale-green jungle that meets the edge of the dark-brown lava field. We followed it as it comes for several miles almost straight toward our peak, then turns and runs due south for at least fifteen miles, to the end of a range of lava peaks that run off due south-eastward from Pinacate. (See Map.) Far away in that locality, somewhere, it turns westward, and at the edge of the sand-hills, in a wide green plain, its trail is completely lost. As a matter of fact, the stream ends in a flood-basin, which Mr. Milton discerned and carefully pointed out to the rest of us. Not a drop of the waters of the Sonoyta ever cross the sand-hills, or reach the Gulf. It seemed too bad that so brave a stream should die so ignominiously, and never meet the sea.

From the appearance of the broad and low-lying val-

ley of the Sonoyta from Agua Dulce to the sand-hills, I am convinced that in comparatively recent geological times an arm of the Gulf of California extended up the Sonoyta valley as far as Agua Dulce. Near the Playa Salada, below Agua Dulce, we found several marine shells, much weathered but still recognizable. Two of these were giant heart shells, 4¾ inches in diameter,—*Cardium* (*Levicardium*) *elatum*,—and the others were *Pectunculus gigantea*.

Strange to say, the view from the summit was not quite what we expected. The coveted details of cone, crater and lava plain were mostly lost to view, and the Gulf was so obscured by haze that no camera was able to record it. In architectural details the view at 2,500 feet is much more satisfactory.

Looking north-eastward we discovered a large, deep crater, distant perhaps six or seven miles, and straight beyond it, about fifteen miles away, we saw the zone of naked ashes that encircles the base of the Cerro Colorado. From that point, swinging westward through at least 120 degrees, the lava plain was thickly set with lava cones, each of which represents an extinct crater. Later on, Mr. Sykes expressed the belief that around Pinacate there are the remains of *nearly five hundred extinct* volcanoes! The mountains of southern Arizona, and those in the vicinity of Sonoyta—Cypriano and Cubabi—show up but dimly, enshrouded in the prevalent blue haze which in this region masks the details of nearly all distant mountains.

At the lofty elevation on which we stood—which Mr. Sykes declared to be 4,060 feet—the sand belt between the

lava country and the Gulf seemed very narrow and insignificant. The head of the Gulf was fairly well revealed, but the mountains of the Peninsula were merely a great mass of Indian-summer haze. It was impossible to locate the Papago Tanks, save by the granite mountains beyond them, at the end of MacDougal Pass.

It was highly interesting to stand on the summit of a peak that rises like a lava island out of a lava sea and view, in one circular sweep, so vast a cyclorama of extinct volcanoes, glowering lava, green desert, distant mountains of blue haze, barren sands and shimmering sea. Smile if you will, Reader; but to us it was a thrilling moment. Had we seen not one thing of interest between Tucson and the Pinacate summit, a half hour with that grand spectacle of Nature, in the wildest corner of Mexico, would have repaid everything.

At last, however, someone bethought himself to remind the Doctor of the mountain sheep that were literally going to waste on the farther side of the western peak; and this roused him to fresh activity in another direction. Leaving us to settle with Pinacate, he girded up his cartridge belt, caught up his rifle and set off down the mountain toward the saddle like him of the seven-league boots. Inasmuch as we had unanimously resolved that the expedition would not move out of its tracks until the Doctor bagged his ram, it was a good thing for him to improve the shining hour.

With the departure of the Chief, the rest of us settled down to business. I did my best to take a series of pictures of the most striking scenery below, then undertook

the task of preparing a record, sealing it tightly in a square tin can and erecting over it a monument in memory of that afternoon. Fortunately, large chunks of lava were obtainable quite near the summit, and with valuable help from Mr. Milton the cairn grew apace.

Mr. Phillips worked his two cameras to their full capacity, and I hoped great things therefrom. With the utmost care he made a complete circle of exposures, fourteen in number, taking in the entire cyclorama of Pinacate. Unfortunately, however, the lenses which in the Rocky Mountains were able to dig out details at a distance of twenty miles were sadly balked by the fine sand in the atmosphere, which produced a deadly yellow haze that even cut out of the pictures the waters of the Gulf.

Mr. Sykes quickly busied himself with his plane-table, and crouched over it until the last moment of our stay on the summit. While we were all busy with our several tasks, the Doctor began to fire on the farther face of the western peak, and we counted several shots in steady succession.

"The ram is running; and the Doctor is getting angry!" explained Mr. Sykes—which eventually proved to be a correct diagnosis of the case. When we all met at camp (the next day) and put the Botanist on the witness-stand about that firing, he gave this testimony:

"After leaving you on the summit I dropped down to the saddle and then worked up the ridge connecting with the western peak, getting out far enough to put my glass on the band of sheep on the farther rim. The last look showed them as dropping off on the farther side of the

ridge, undisturbed after a last look at the party back on the main peak. The hunt now seemed to me all but ended, and I thought I had but to work around the convexity of the slope on which they grazed and select my trophy.

"A careful stalk was made, and as I wriggled through the notch in the last lava dyke, which I supposed separated me from the band, imagine my dismay at seeing them, *as I thought*, on the slope and crest of the small peak across the cañon, to the westward. This meant another two long miles of stalking, and if the band had made so far in so short a time, it meant that they had been alarmed, or had winded me, and some careful work would be necessary to come up to them.

"Quickly dropping down to the bottom of the cañon, I had hardly started up the opposite slope when over my left shoulder I caught sight of the original band of eleven in a shallow gulch of the slope I had just left! The discovery was mutual, and for a moment I stood feeling as unprotected as if I had been stalked and cornered by as many mountain lions.

"The band was strung along the mountain side, from which they were so little different in colour that at a distance of something less than three hundred yards I was obliged to use the glass to find the horns that were mine by the laws of the chase. The bearer thereof was quickly located at the farther side of the bunch, where he stood on a low lava block, keeping a most inefficient guard, for which he was himself to pay the penalty. Before I could cover him to fire, two ewes and a smaller ram grazed in

front of him, and I was obliged to lower my rifle twice before I sent the first fatal shot home. It was placed too far back, however; and then there began a running battle.

"I had spent the previous day and a half on the long and devious trail of the wounded bearer of the 'head of heads' without coming up with him. As this band broke for safety, the doomed ram among them, they had to course about me in a semicircle at two to four hundred yards, and I resolved to bring down this head from where I stood. As the band now bunched and scattered in its headlong flight, I might have laid half of them low, but ignoring them entirely, I drove straight for the ram at every opportunity when he was not behind rocks or masked by fleeing companions.

"Although firing a 220-grain bullet, I saw shot after shot go home with but little effect, until at last, as the band began to emerge from the amphitheatre of war, far to the left, a ball through the spine let him down. As I saw him drop the gun-barrel scorched my hand, and the scattered shells about me gave evidence that I had fired at least twenty times. Making my way to the fallen game, I found that he had been hit once out of every four times I had fired, and each of these five shots alone should have been quickly fatal. The second shot had struck the frontal bone and carried through the skull without entering the brain cavity, but even after this terrific blow the ram had run for nearly a quarter of a mile. This time the biggest one did not get away."

After the Doctor had killed his ram quite dead, he

hurriedly cut off its head, eviscerated the body, left a note to Mr. Sykes on the horn of his saddle, requesting him to bring the head to camp on his horse, and then immediately set out at a rattling pace for camp. Mr. Sykes presently came along, and did as he was requested; and so for that day we saw him no more.

It was late in the day when Mr. Phillips, Jeff and I left the summit and scrambled down. We hurried through the notch, and after a walk that was very painful and correspondingly long, we reached our horses and saddled up. By that time only one hour of daylight remained in which to go to our two sheep, dress them and get out of the worst of the lava before darkness fell! It was very evident that to do all that in one brief hour was a wild impossibility. Said Mr. Milton,

"We'll have to light out for camp, and come back in the morning to get those sheep."

I said,

"That would mean twelve miles of travel over this awful lava, the whole of to-morrow forenoon consumed by the return here, and an entire day lost. I think it will be wise for us to camp up here to-night, get an early start and get the sheep to camp in time to work them up to-morrow afternoon."

Mr. Phillips agreed with me; but said Mr. Milton,

"We're not fixed for lying-out here! We've nothing to eat, and our horses have had neither grass nor water since morning."

"We can get along all right. We can water our horses in the arroyo where my sheep lies. We have plenty of

sheep meat, and as for grass, it won't hurt the horses to fast until to-morrow afternoon."

It was quite clear that at least two men and one horse would camp on Pinacate that night and make six miles of rough travel serve the occasion instead of eighteen. At first the proposal did not at all commend itself to the mind of Mr. Milton, and I feared a radical disagreement. But he acted very handsomely about it, and presently, with real cheerfulness, consented to join in my scheme. With a feeling of profound relief over thus saving a whole day at a time when the sands of my leave of absence were running out horribly fast, we set about making horses and men as snug as possible for the night.

CHAPTER XX

"LYING-OUT" ON PINACATE, AND THE FINAL SHEEP

A Camp-Fire in a Lava Ravine—A Dinner of Broiled Liver—The Resources of the Party and Their Distribution—The Gunny-Sack as a Producer of Warmth—Mr. Phillips Takes Advantage of a Sleeping Comrade—The Coyotes Spoil a Museum Sheep—"Why Don't You Shoot that Ram?"—Curiosity Long Drawn Out—An Unexpected Trophy—Mr. Sykes Stalks a Mountain Sheep on Pinacate.

In the belief that any Reader who has resolutely waded thus far may also be interested in knowing how we fared when compelled by circumstances to "lie out" in the lava beds of Pinacate, I will set down the doings of that rather romantic occasion. There is seldom anything startling about such an incident, but for myself I always like to know just what the other fellow did when he was "caught out."

First of all, we led our horses over the roughness to the deep lava gulley in which my seventeen-inch ram lay dead, and watered them at the little pockets of water that we found there. Then we located the horses on smooth lava that was somewhat sheltered from the west wind, where they could at least amuse themselves by pretending to browse on some stunted mesquite bushes.

I scrambled up to my sheep in the head of the ravine, to do the marketing for the camp. Through a flash of

unusual animal intelligence on the previous day, when I dressed the carcass I carefully cut out the liver and laid it on a chunk of lava for future use. This I made haste to gather in, besides which I hacked off a section of the hind quarter. Before darkness fell we looked about for dead wood that could be utilized for our camp-fire without the intervention of an axe; for of axes we had none.

We found a most picturesque dead stub of a once huge mesquite, clinging by one root on the sharp edge of the ravine. At the base it was as large around as a flour barrel, but it was only fifteen feet high, and so shaky that we undertook to vibrate it into the bottom of the ravine. But that one deep-seated fang of a root, which once ran down to the stream bed, baffled our united strength. After giving up beaten, we lighted a fire at the base of the hollow trunk, on the windward side, and away it went! In half an hour it was a veritable pillar of fire, visible from afar, and later on was seen by Mr. Sykes as he picked his way campward across the black lava-plain 1,500 feet below.

In the bottom of the ravine, a short distance below the pillar of fire, Mr. Milton found a remarkable ironwood tree with two large naked trunks, one green, the other dead and dry, both writhing over the ground like huge snakes before they finally rose into the air.

"This big, dry stem will make us a bully fire while she lasts," said Jeff, admiringly. "We'll build right up against it, and by and by, when it burns in two, we can work in the whole of it."

We gathered all the dead mesquite stems that we could find in the neighbourhood and tear loose by hand-and-foot power, but the total accumulation was inadequate for an all-night camp-fire. It was certain to grow cold soon after sunset, and we looked forward doubtfully toward the small hours of the morning.

If you slice carefully the liver of a reasonably young mountain sheep, impale it on a long stick just so, salt it well and broil it very carefully "well done" over a bed of hot coals, you need not go hungry—unless you have too many competitors.

If the operation has been conducted with intelligence as well as with main strength, the product makes a fine and tasty dish; and any sportsman who cannot make of it a good square meal is to be regarded as a suspicious person. A hunter of big game should not fail to carry salt; for in the queerest ways imaginable the ability to eat a comfortable meal may suddenly be found hinging upon its possession. If you are caught out with meat, but saltless, then cut your meat rather thin, and broil it until rather overdone; for an unsalted steak or chop that has been burned to a crisp can be eaten with fair relish when the same morsel rare, or underdone, would to some men be impossible.

Directly in front of our camp-fire the bed of the ravine was smooth and shaped like a cradle; and it was there that we must lie, willy-nilly, to gain warmth from the fire. A big clump of bushes, of a species unknown to me, but very dense and very springy, completely covered the steep face of the ravine wall farthest from the fire. Jeff Milton

tested the mass with his outspread hand, and finding it as springy as a pile of hay, he said,

"These bushes will make a bed plenty good enough for me. I don't want anything better than that. I'll just spread my blanket over and have a fine spring mattress."

Mr. Phillips also elected to sleep on the white bushes, but I chose a spot low down upon the rocky bed of the ravine, and more sheltered from the wind. Of course we all lay within the zone of light and warmth.

On taking an inventory of our resources, we found that we had two small and light saddle-blankets, belonging to Milton; two thick felt saddle-pads; a gunny-sack, a coat belonging to Mr. Milton, another belonging to me, and a bag of salt. (It was Milton's salt that really saved our lives.) Mr. Phillips had no coat, and therefore one blanket and one saddle-pad were issued to him. To Mr. Milton was assigned the other blanket, and to me fell a saddle-pad and the gunny-sack; with which, and my coat, I was by no means badly provided.

Feeling reasonably sure that the snapping cold hours after midnight would disturb our rest, we turned in immediately after our broiled-liver repast, while the fire was at its best, and the night the least cold. One man whom I know thanked his stars that he was not hunting camp in the dark across four or five miles of lava; and in spite of an endless chain of cold thrills that chased each other up and down his anatomy from head to foot, tradition states that forthwith he went sound asleep, and slept hard and fast for several hours.

At first, however, through his sleeping fancies there ran a distinct thread of thought, thus: "A gunny-sack is a cool proposition on a windy night. . . . What a pity 'tis that gunny-sacks are not more closely woven! . . . Gunny-sacks are *very* much too small. They should be made wider, to cover more than one side. . . . It will be much colder pretty soon; and then I will have to get up."

Then there followed an interval of complete oblivion—how long, I knew not until later. After that, my mind began to take heed of Life, and resumed its functions thus—for I remember the sequence very well:

"How *comfortable* it is here! . . . Who would have believed that an *old gunny-sack* could keep a man so *warm!* . . . How mistaken I was about this sack! . . . There is really a surprising amount of warmth in it!"

Finally I opened one eye, and saw John Phillips sitting close up to the much-shrunken camp-fire, dropping small sticks upon the coals, and smiling to himself, as if at a good joke! Why was he not in his place, and sleeping? And why laughing—at that hour?

As I moved my hand, to turn and speak to him, it came in contact with cloth that was *woolly* and *warm;* and in another second I was shocked into full wakefulness by the discovery that I had been betrayed! While I soundly slept, my comrade had risen, taken his only blanket, completely covered me with it, and tucked me in so gently and skilfully that I did not waken! That was the reason why my old gunny-sack had kept me so warm, and finally wakened me by the wonder of it. And John M. was laughing over his success in outwitting me!

Full of indignation, I arose to protest, and explain how it happened; but obtained no satisfaction. Then John and I went cruising out into the darkness for more wood, and presently found a good supply. By uniting our strength, we tore down and ripped up a large dead mesquite, then gathered in some dead ocatilla stems, and fired up so successfully that Jeff was compelled, in self defence, to move farther from the fire. Dead ocatilla stems burn with the snap and brilliancy of hickory bark, and while for light they are great, they of course cannot yield much heat, nor burn for long. Many "brilliant" men are just like them.

Jeff presently sat up to enjoy the fire, and during the two hours that we sat there, roasting ourselves and trafficking in yarns, he told us several thrilling incidents of his swiftly moving life. There is one in particular that I would fain recall; but it was then impossible to take notes, and later on we were so hurried that there was no opportunity.

At two in the morning the body of the dead ironwood python burned in two, and by a process in simple addition the fire renewed its lease on life. A cold wind blew crosswise over our heads, but in our snug cradle of lava it affected us not at all. After our camp-fire yarns had been spun out to drowsy lengths we settled down once more, secured a second edition of slumber, and by common consent awoke at the first peep of day. During the whole long night we did not hear a sound from any wild creature.

While Jeff and I broiled over a fine bed of coals a

From a photograph by J. M. Phillips

The Camp-Fire on Pinacate

generous quantity of mountain-sheep steaks, Mr. Phillips expended a film in photographing our hospitable camp-fire and lava bed; and half an hour later the serious business of the day began. Of course we did not feel quite as fresh and supple as after an unbroken night in our good sleeping-bags, backed by a breakfast of Frank's excellent making, but we were glad that we had remained where we were instead of making the long and tiresome trip to camp and back again.

Very soon after sunrise we took the yellow mule and a pack-saddle, and, leaving our rifles at camp, labouriously picked our way northward around the foot of the mountain nearly a mile, to where lay Mr. Phillips's ram. We intended to skin the entire animal and preserve it for Dr. Holland's museum, but alas! the rascally coyotes of Pinacate had visited the remains and left it an unsightly wreck. The hind-quarters had been completely devoured, and the skin of the body had been ruined past redemption.

The head, however, was untouched. Although Mr. Phillips had entertained no fear of coyotes, in deference to a long-standing principle of caution when he dressed the carcass he had collected large chunks of lava, and with them completely covered the head. That was all that saved the trophy. Fortunately, my ram had not been visited by the marauders—possibly because of our close proximity.

We cut off the head and placed it upon Polly the Mule for the return journey. Mr. Phillips elected to leave us there, and went off northward for a solitary scramble through the lava, and a final return to camp by a new

route. In five minutes the convulsed lava swallowed him up and we saw him no more.

Mr. Milton and I started back to our bivouac and had slowly picked our way over about half the distance when he asked me a question.

"Where did you say you were when you first sighted those two rams?"

I faced a quarter way round to the right, took my bearings and finally said,

"We were up on the crest of that ridge, behind the tallest mesquite bush which you see yonder."

Jeff looked, and said with a satisfied air,

"Oh, yes; I see." And a moment later he added, in the most matter-of-fact way imaginable, "*But why don't you shoot that big ram, over there?*"

By all the powers, there stood in *full view*, on the crest of a lava ridge, and not more than two hundred yards to the left of the bush at which I had pointed, a splendid mountain ram—a "bunger," for fair! He posed on a high point, statue-like—head high up, squarely facing us, outlined against the sky and staring at us with all-devouring curiosity. At that moment he was quite beyond fair rifle-range; and we were without our rifles! What fools these mortals be!

I looked at him through my glass, and he stood as still as an iron dog. Not once did his gaze leave us, not once did he wink an eye nor move an ear; but, dear me! how grand he did look! It seemed as if he owned the lava, and had caught us trespassing.

"Now, what *fools* we were not to bring a gun!" said

Jeff, with an air of deep dejection. I dare say it was the first time in many years that Jeff had found himself gunless in the presence of an enemy.

"Well, it don't matter," I said. "Another ram will answer my purpose quite as well."

"*I* believe he'll stay where he is until we can get our guns," said Jeff, hopefully. The wish was the father of the thought.

"Oh, impossible!" I said. "He *never* will wait that long. It's a long way yet to our camp; and he'll clear out in another minute."

"Well, now, he *may* not! Let's make a try for our guns, anyhow, and see if he won't wait. I'll tie this mule here where his nibs can see her, and we'll just quietly slip off after our shootin'-irons. I wouldn't be one bit surprised if he'd wait."

I thought that the effort was absolutely certain to come to naught, and that before we could get our guns and return with them the ram would be a mile away. To follow him up would be out of the question, because of pressing duties ahead. But Jeff was so cheerful about making the effort that I could do no less than cheerfully join him, and take the chance. It was precisely like the occasion in the Hell Creek bad-lands when, to oblige old Max Sieber, who wished me to see where he "missed that big buck," I climbed after him to the top of a butte and from it killed a fine mule deer, *in spite of myself!*

Milton's feet were almost as lame as mine were; but as fast as we could we hobbled over the lava to our camp, caught up our rifles and hiked back again.

"He's there yet!" said Milton, triumphantly, when we sailed up abreast of the sorrel mule. "He'll wait for us!"

Then I began to feel an awakening of hope and interest, and we applied ourselves seriously to the task of making a good stalk. An intervening mound of rough lava offered our only chance of an approach, and when finally we got it in line between ourselves and the ram, he was still there, gazing intently at the decoy mule.

The top of the mound was distant from the ram about one hundred and seventy-five yards. Mr. Milton was on my left, and he deployed in his direction while I made off to the right side of the hill. We must have been about a hundred feet apart. There was no such thing as signalling each other, and it was agreed that the first man to secure a fair chance should fire. Knowing the quickness of my good friend Jeff in getting into action with a gun, I let no great amount of grass grow under my feet after we separated.

Evidently, I was first to reach a coign of vantage, for suddenly I found the living-picture ram standing full in my view, within fair rifle-shot, squarely facing Milton's position, and with his side in perspective to me. Aiming quickly, yet with good care, at the exposed point of the left shoulder, I let go; and like a quick echo of my shot, Milton's rifle rang out.

Instantly the ram wheeled to the right and—vanished, as if the lava had swallowed him up.

Jeff and I were almost dumfounded with surprise. We expected a fall, a leap, or at least a stagger—anything save swift and total disappearance.

"*Well!* What d'ye make o' that?" said Jeff, with a troubled air. "Can it be *possible* that *both* of us missed him?"

"It begins to look like it," I answered.

With the best speed that we could put forth, we hurried over to the crest of the ridge, where the ram had posed so long and so beautifully, and with eager glances swept the view beyond it. Not a living thing was in sight. Jeff was more puzzled than before; but for once reason came to my aid. I said,

"Jeff, it is impossible for that ram to have run clean out of sight by this time. He must be somewhere near, either wounded or dead. Look for him lying down. He may jump up and run, any minute."

"We must trail him up if we ever want to find him," said Jeff, gloomily.

"Trail nothing! I'm going to hustle off down yonder, the way he *should* have run, and see if I can't scare him up."

"Well, you go ahead; but I'll follow his trail. . . . See, here it goes!"

I figured that if wounded the ram would be certain to run down hill; so I ranged down and away, over the smoothest course I could find. In less than a hundred yards I turned a low corner of lava rock, and there on a smooth spot lay the ram—stone dead, without a struggle. He had been killed by a bullet that had entered close behind his left humerus, ranged diagonally throughout his vitals, and lodged so far back in his anatomy that my utmost efforts in dressing the carcass failed to locate it.

He had also been hit by another bullet, but that shot was quite harmless.

Naturally, we were profoundly elated over our success; and I did not recover from the surprise of it for fully a month. Previous to that day, I thought that I had learned something about wild animals, but my best efforts failed to read aright the mind of that ram. But for the insistence of my good friend Milton, I never would have taken a step to fetch my rifle and stalk that animal; for I believed that the chances of his waiting for us were not more than one in a million.

And now, in the light of the final result, what shall we say of the mental processes of that animal? One man's opinion is as good as another's, and the Reader can judge quite as well as anyone. As for myself, I have two thoughts:

First, I think that ram never before had seen men, he did not know what we were, nor did he even suspect that we were dangerous, predatory animals. Next, his bump of curiosity was inordinately developed, and he was fairly fascinated by that *Naples-yellow mule with a big sheep-head on her back*. I think he recognized the horns of a creature of his own kind, but the location of them—on the back of a strange mule—was to his simple mind an unmitigated staggerer. His efforts to solve the problem thus suddenly thrust upon him eventually cost him his life, and gave me a trophy that will outlast its owner by half a century or more. In the group of our mounted sheep heads it is No. 4. The horns measured fifteen and one-eighth inches in circumference by thirty-three inches

in length. As the table of measurements will show, their bigness was continued all the way from base to tip.

The pelage of this sheep was thin, old and poor. It seemed to be in a shedding period—out of all season for such a change.

With two men, three big sheep heads and two saddles of mountain mutton our pack-mule and two saddle-horses were loaded down until Plimsoll's Mark was buried out of sight. In order to get on, I was obliged to carry my sheep head in my arms. At first I resolved to walk, and devote my horse to freighting the trophy; but Mr. Milton said severely,

"Oh, thunder! Get on your horse, and make him carry you and the head, too. It won't hurt him a bit. Why, with my feet as lame as they are now, *I* wouldn't walk to that camp for all the mountain-sheep heads in Christendom!"

Even the ride to camp was tedious and tiresome. We arrived about noon, stiff and sore; and for my afternoon's rest and diversion I had to skin four sheep heads, work up the whole buck antelope that Charlie had brought in—most excellently protected—and prepare about twenty-five pounds of meat for drying. The only thing that sustained me at the last, and really saved my life, was Mr. Sykes's account of stalking a mountain-sheep ram that very morning on the north side of Pinacate. He said,

"I was on my way back from my work on the summit [his second trip], and while swinging around that north slope, quite near to where I saw that bunch of sheep, I saw,

ahead of me, a big ram. He was partly hidden by lava, but I saw his body quite plainly. He was lying down, resting himself, and I made up my mind to have him.

"When I first saw him he was about four hundred yards away, and the mountain-side there was very bare and open. Well, I tied my horse, quite out of sight, got down on my stomach, and wormed my way over the lava until I got within about a hundred yards of where I had marked down my sheep. I raised my head, and saw that he was still there. Finding that he was quite quiet, I decided to work up closer; and I did. Lying as flat as I possibly could, I wormed my way up fifty yards farther, to make *real sure* of getting him. I was pretty well blown by that time, and the rough lava was quite unpleasant to my hands and knees; but I thought the ram was worth it.

"At last, when I had finished a good stalk and was *quite* near enough, I got good and ready, slowly raised my head and my rifle and was *just* about to pull trigger, when—I changed my mind, and didn't fire."

"What! You *didn't fire?* Why not?"

"I saw that I didn't need to. The ram was already dead! *It was the headless body of the sheep that the Doctor shot yesterday!* . . . Then I came home."

CHAPTER XXI

THE YARN OF THE BURNING OF THE *HILDA*

The Characteristics of Mr. Godfrey Sykes—A Versatile and Remarkable Man—The Yarn of the *Hilda*—A Quick Transformation Scene on a Desolate Shore—A Foot-Race with Death—Impassable Mountains—Seven Hard-Tack for 160 Miles—A Tough Coyote—A Fish in Time—Swimming the Colorado—A Bean-Pot at Last—The End of Charlie McLean.

As previously intimated, our Official Geographer, Mr. Godfrey Sykes, was a man of remarkable personality. Take him anywhere outside the purlieus of a modern city, and there are few things that he cannot be and do. He has the skill and experience of mature manhood, the strength and energy of youth, the knowledge of a man who has travelled and done much, and the spotless manners of an Arizona Chesterfield. Until I saw him on the desert, I had thought that Dr. MacDougal was under a Sykesian spell; for I could not figure out how one man of this earth could combine in his one self as many desirable qualities as G. S. was said to possess.

I entered the orbit of the Arizona Wonder rather prejudiced, but Mr. Phillips and I now agree that the Paragon is the real thing, unique and *sui generis*. The only fault in him is that in the deserts he *will go hatless*, with the sun beating down upon his head until it makes

all other heads ache to see it! His scalp is now the colour of fried bacon, and his thin, curly thatch of hair looks as if it had been baked to a crisp—which it has. But of this he recks not, provided the mountains to be climbed and the craters to be descended are sufficiently numerous to keep him from becoming burdened with "ongwe."

Mr. Sykes is an Englishman, but not at all of the comic-paper type. His H's are so securely lashed that none ever go adrift, and his command of the mother tongue is to his listeners a source of delight. Professionally he is an engineer, and it was he who was kindly loaned by Dr. MacDougal to the Solar Observatory at Pasadena to build a practicable road up a steep mountain to the seat of war after other engineers had balked at both the sum available and the time limit. Mr. Sykes drew the plans, hired Japanese labourers, bossed them, and the work was triumphantly carried through, on time.

At Yuma, Mr. Sykes built a boat for the Desert Botanical Laboratory, which has successfully navigated the treacherous waters of the lower Colorado, and the head of the Gulf. By the same token, he previously built at Yuma a rather presuming little sloop, called the *Hilda*, which promptly came within an ace of undoing both himself and his partner in the seafaring business.

I had collected from the Doctor various interesting fragments of that story, and patiently bided my time. It was while in camp at the Papago Tanks that the narrow margin of time between the consumption of ten solid pounds of fried mountain-sheep steaks and bedtime offered the opportunity which we had stealthily awaited.

To talk about the Gulf of California, which all day had lain level and shimmering under our eyes, was natural and easy; and a timely mention of "Puerto San Felipe," as it is marked on the maps, led to vigourous remarks from the Geographer.

"Nothing could be more ridiculous," said he with much energy, "than that fake port. From the name on the map, anyone would expect to find a town there, or at least a settlement of some kind. As a matter of fact, there is neither port, nor settlement, nor even a hut; and there is not a soul within a hundred and fifty miles. There once was an empty tin can, but my partner and I took that away with us when we hiked northward to reach a settlement while we had strength enough to travel. I tell you, that name on the map is dangerously misleading, and some day it may cost the life of some poor castaway who struggles to it, thinking to find a settlement."

That was the psychological moment; and with one voice several of us demanded to know all about the burning of the *Hilda*, and its consequences—which the Doctor always gently spoke of as "a *might-tee* close call for Sykes!" The Geographer was in the right mood, and forthwith told us this story, word for word, as here set down.

"Well, gentlemen, it is now about seventeen years ago that I joined in with a husky Scotchman named Charlie McLean. At Yuma we built ourselves a very good little sea boat, twenty-seven feet long, half decked over and schooner rigged. We decided to sail down the Colorado to the Gulf of California, then on down to the west coast of Central America and after that to wherever the Fates

might direct us. We took in plenty of provisions, and as we ran out of the mouth of the Colorado, into the head of the Gulf, the world looked very much like our oyster.

"The tides in the head of the Gulf are very heavy, and we put in a week or so playing with them, before heading down the Gulf. Finally we decided to go down on the Peninsula side, and cross the Gulf lower down.

"One evening we ran into a little inlet near Fermin Point, and camped on shore behind a low ridge of sand that had blown up parallel with the shore. It was a rough, windy evening, with the wind blowing half a gale; and with a piece of canvas we rigged up a small shelter-tent to keep the sand out of our eyes, and out of the bean-pot.

"As it began to grow dark, I went down to the boat to light our lantern. It was one of those old-fashioned railroad lanterns, that can't be trimmed without pulling out the whole bottom. I fiddled and fussed with it for quite a while, under the forrad deck of the *Hilda*, out of the wind, striking a number of matches; and, as I now suppose, I dropped some of the burning ends while struggling to get the light to suit me.

"The tide was out, and the boat lay high and dry on the sand. I suppose one of my burning match-ends fell upon something burnable. But I didn't know it at the time, and went back to our camp-fire.

"Half an hour later, as we chanced to look seaward over the top of the sand ridge, we saw a glare of light, and heard the popping of cartridges. We rushed for the boat, but found very little left of it, and none of our provisions. Our can of kerosene had melted open, and all

that was left of the boat was pretty well covered with the best fire-maker in the world, and burning fiercely. Our water-cask, however, was still safe, and we threw wet sand upon it until the fire around it was smothered. It was absolutely *the only thing* that we saved from that boat!

"Well, it didn't take much reflection for us to see that we were in a first-class fix. We knew that southward the nearest settlement was at least two hundred miles away, and no water between. Northward, the nearest settlement was about one hundred and fifty miles away, on the Colorado River; but between it and us lay a great alluvial desert plain, cut up by numerous creeks and arms of the river, some of which would be very difficult to cross.

"We took an account of stock, and found that we had, of provisions, a pot of beans, thirteen hard-tack biscuits and one go of coffee in the coffee-pot. That was absolutely all!

"Our guns and cartridges had all been burned up, with the exception of a little sawed-off 20-gauge muzzle-loading shotgun. This grand weapon was one that somebody had given to Charlie to use in killing small birds, and for it we had exactly two loads. We also had some blankets, my sextant, a chart, a boat compass, field-glasses and some tools. Among the tools was a soldering-iron and some solder; and so in the morning, when we had looked things over, I took the tin lining out of our water-tight locker and made a couple of canteens. They were pretty rough, but they held water, and afterward served us mighty well. I don't see how by any possibility we could have pulled through without them.

"After long and careful figuring, and calculating our chances, we decided to cross the Peninsula, and make our way to the west coast, where we knew there were some settlements. Back of us lay a strip of low country about six or eight miles wide, and then the high mountains began. We filled our canteens with water, took the compass, chart, sextant, the blankets, beans and hard-tack, and started westward for the mountains.

"We reached the foot of the range, and spent a whole day in trying to make our way up the face of it; but I tell you those are the most straight-up-and-down mountains that you ever saw. It was nearly, if not quite, impossible to climb up that fearful eastern wall—at least where we were. At last we decided that rather than use up our time and strength in such a fearful struggle as that was, with mighty doubtful results, we had better go back to our water-cask, fill our canteens again and try for the settlements on the Colorado. We therefore ate up the remnant of our beans, hung the empty pot on a dead iron-wood tree—where I have no doubt it is to-night—and the next morning went back to the remains of the *Hilda*. It was then quite clear that our only chance lay in reaching a settlement on the lower Colorado.

"That night we made some small cakes out of a small handful of flour—soaked in kerosene—that we found under some wet sand in a corner of the burned boat.

"On the third morning we set out northward along the coast. We had seven hard-tack each, with one hundred and sixty miles of foot travel ahead of us before we could reach the Colonia Lerdo, above the head of tide-

water on the Colorado River. That was the nearest prospect of another dip into a bean-pot; and it seemed a mighty long way off!

"The water question was our chief worry. We thought we might make between twenty and twenty-five miles a day over the sandy country that we would have to cross, and get on fairly well on one hard-tack apiece each day; but a gallon of water per man each day seemed a mighty slim allowance. However, things turned out better than we had expected. On the morning of the third day out from our boat, when we were rounding the bottom of San Felipe Bay, we saw a coyote trail running into a small, brushy flat. Believing that it led to water, we followed it, and found a small well, or spring, of good, wholesome water. This watering-place had been known to the seal-hunters and others for a long time, and we had heard of it in Yuma, but no one had been able to give us definite information about it.

"We remained there all that day. On the rocks along the shore we found lots of oysters—and I tell you they were *might-tee good!* I really doubt whether we could have pulled through without them. Charlie had a fish-hook in an outlying pocket, and with it he tried to catch a fish; but it was no go.

"That night as we lay in our blankets, near the spring, I felt something tugging at my toe, and looked out. It was bright moonlight, almost as light as day; and there was a coyote, trying to steal my blanket.

"That was his undoing. I roused Charlie, who still carried his little shotgun with its two loads. Up to that

time we had not seen a single living thing sufficiently near that it could be shot. The coyote didn't seem to mind in the least our speaking or rustling around, but just stood and looked at us, much as a dog might do. After a little trouble with a damp cap, and a hunt in his pockets for another, Charlie finally made out to shoot that coyote; and as it was nearly daylight we got up, skinned him and cooked a hind leg over the coals of the camp-fire.

"That was positively the rankest thing in the shape of meat that I ever tackled. Even with oyster sauce it was almost uneatable. Apparently our dead friend had lived exclusively upon a fish diet, and spoiled fish at that. Although we ate all that leg, burned the other one almost to a crisp, took it along to gnaw upon, and tried to make the best of it, I am bound to say that from that day to this I never have enjoyed broiled coyote as an article of diet.

"In the lower part of San Felipe Bay we found the wreck of a little schooner, lying on the beach, and near it we also found the remains of two rusty tin cans. Those we filled with oysters and started on northward.

"For thirty miles below the mouth of the Colorado River the western coast is very flat, soft and muddy. The heavy tides flood the country for miles back from the shore of the Gulf. This we had discovered on our way down. We now were compelled to steer a course toward the westward mountains, and keep close to the foot-hills until sufficiently far north to strike across eastward for Hardy's Colorado, the nearest fresh water that we were sure about.

"It took us four days of pretty hard pegging to make that stretch. Our rule was to march fifty minutes of every

hour and rest ten minutes, and we adhered to it quite closely. I think it was very wise. I used the chart and compass to steer by, sighting on the mountain peaks. The low country was so obscured by haze and mirage that it was very difficult to navigate without mistakes. When at last I decided that it was time to turn east toward Hardy, our canteens were about dry. With our knives we punched a little hole in the lower corner of each, drained out the last drops of water into the particular parts of our throats that seemed to be dryest, then laid down the canteens for the next wayfarer in those flats who might need them.

"We reached the Hardy about on schedule time, and we took two of the longest and wettest drinks on record. It seemed as if we had never before known what it was to be thirsty. After that we began to cast about for something that we could eat, but there really seemed to be nothing doing in that line. Charlie dug up his fish-hook once more, and with a piece of twine we set a night-line. We baited it with a big, fat and most edible-looking grasshopper. It seemed a pity to gamble the hopper on the remote chance of winning a fish, but like real sports we decided to risk it.

"The result justified our sportiness; for the next morning, when we looked over the edge of the bank, we saw a fine, large mullet lying on the mud, waiting for us. Now, as far as I know, the mullet is a fish that don't take a hook at all; but that one had managed to get himself hooked in the gills, and the tide had gone out and left him high and dry.

"Charlie made a dive for him over the edge of the bank, and I always accused him of trying to catch that fish in his teeth, for he came up with his face covered with mud. We rolled the mullet on the grass, gloated over him, daubed clay on him, warmed him for a few minutes over our camp-fire, then being utterly unable to wait any longer, we fell to and had a very fine fish breakfast.

"We crossed the Hardy, and headed into the tule and wild-flax brakes toward the Colonia Lerdo. It took us two days to make the river, for we were then getting weak, and it was mighty hard work pushing through those marshes. At last, however, we reached the west bank of the Colorado, at a point a few miles below the colony, but on the wrong side of the river; and it was a case of swim or starve. The river was wide, and the currents were mighty uncertain. We were afraid to tackle it with our clothes on, and without a raft.

"We burned off some small dead willow trees, then burned them into lengths, and with our fish twine, some bark and osiers we made a little raft, large enough to carry our clothes and blankets, and other plunder.

"The water seemed awfully cold, but we had to stand it. Fortunately, we were both of us fairly good swimmers, and we pushed the little raft ahead of us very successfully. After a long pull we reached the other side and landed on a comfortable sand-bar. After that our troubles soon came to an end. We soon found an old cattle-trail, and after following it about three miles we reached the colony.

"In the camp of a couple of Americans who were down in that country hunting wild hogs we found a pot of

freshly cooked beans. I don't like to think how many we ate; but I know that in the middle of the night I got up to have a few more. Before I knew it I had finished the pot, and was wishing for more. Talk about hunger! It took us a whole week to get enough!

"We rested one day at the colony, then headed up for Yuma, which was about seventy-five miles away. The road was fair, and there were several watering-places, so we got on finely, and soon reached the metropolis of the Colorado desert.

"Poor Charlie McLean was afterward drowned in the Grand Cañon of the Colorado. Two of us made a trip of thirty miles down through the rapids, to recover his body, but we never found it. He was a mighty good fellow, was Charlie."

CHAPTER XXII

NOTES ON THE MAMMALS BETWEEN TUCSON AND THE GULF

Desert Conditions—The Pack-Rat and Its Wonderful Nests—The Kangaroo Rat—Harris's Chipmunk—No Arboreal Squirrels—Jack-Rabbit and Cotton-Tail—The Coyote—Prong-Horned Antelope—Deer—Peccary.

In one respect, the wild beasts of the field are like civilized men. They insist upon living wherever Nature affords them the slightest foothold. So long as the world stands, the smoky-faced Eskimo will shiver and starve in his beloved Greenland, the Congo pygmy will grope through the gloom and fever of his equatorial forest, and the Bedouin will gasp and sweat on his blistering sands. Give a man a fixed annuity of bread and butter, and he will not ask for immunity from anything. If the first applicant does not accept the bread, the butter and the situation, of a surety the second one will.

Like the creosote bush, the mesquite, palo verde and the cacti, certain animals have decided that the deserts offer an opportunity for life, liberty and the pursuit of happiness that is not to be ignored. Much saving grace lies in the "pursuit." The wonder is not there is so little animal life on the deserts, but rather that there is so much. Now, were I a kangaroo rat, the awful heat and thirst of the arid region generally would at once drive me to the

vicinity of Manhattan, Kansas, where everything is lovely, except the Kansas River on a rampage.

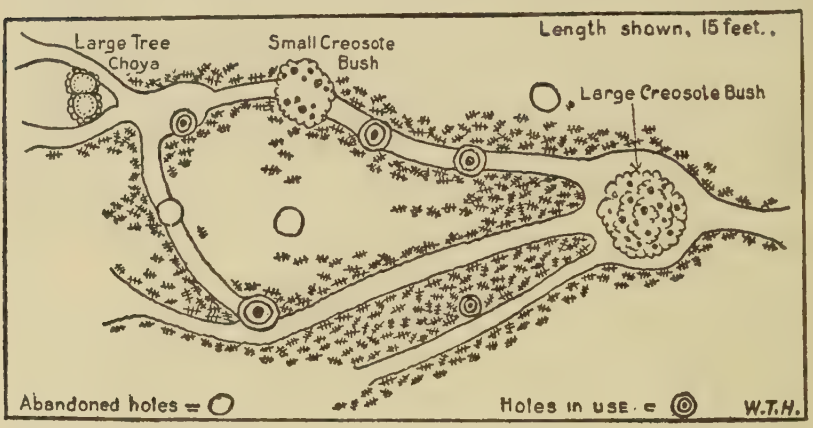
The jack-rabbit, the cotton-tail, the pack-rat, kangaroo rat, chipmunk and coyote have elected to locate and live in the deserts, partly because they think it is to their best interests to do so, and also because they enjoy it. Long before civilized man began his relentless persecution of the beasts of the field and the fowls of the air, they moved in and took possession, to grow up with the country. Excepting the large game, I think that thus far civilized man has made but little impression upon them; and that is one of the reasons why they are so interesting. I hope that some day some keen and truthful naturalist will go into the deserts and up to the mountain-tops of our devoted country, spend time and really find out how our small neighbours live, all the year round.

To my mind, the "Pack-Rat," or, to be quite specific, the White-Throated Wood-Rat,* is the most interesting four-footed creature of the deserts which we traversed. We had him with us all the way from Dr. MacDougal's Desert Botanical Garden at Tucson quite up to the lava peaks of Pinacate. Judging by the wide intervals between his nests, he must be a great traveller. The nests were by no means numerous, and as we saw them, they *seemed* to average nearly five miles apart. Will someone tell us whether this animal sometimes migrates all alone, and nests for a period in single blessedness, or whether they *always* pioneer in pairs? In view of the distances by which Pack-Rat nests are separated, we should like to

* *Neotoma albigula.*

know the habits of the animal in its marriage relations. In the deserts and lava a Pack-Rat's nest very often is developed into a formidable affair. When choya joints are plentiful and cheap, it becomes a regular fortress, impregnable to coyote, fox and even the naked hands of man. Let us consider the very first rat fortress that we met with in Arizona:

It was in the level plain surrounding the base of the



Fortress of a Pack-Rat, at Tucson.
Defended by the spiny joints of the Tree Choya (*Opuntia fulgida*).

Botanical Laboratory mountain, at Tucson. Usually the desert nest of this animal consists of a two-bushel heap of dry sticks, horse droppings, small stones or choya joints, according to availability. This one was of very particular interest because of the oddity of the scheme that the little beast had worked out.

The fortress consisted of several burrows, *the roads leading to which were all carefully protected by barriers of cactus joints!*

I am going to describe and map what Dr. MacDougal, Mr. Phillips and I saw, and leave the Reader to draw his own conclusions. On the spot I drew a map of the whole affair; and when it was finished it was submitted to my companions for inspection, and comparison with the original. They examined it with some care, and said that it fairly represented the situation. A fac-simile is reproduced herewith.

The habitant had chosen to make his fortress between a large creosote bush and a tree-choya cactus (*Opuntia fulgida*) that grew on bare ground, twelve feet apart. When away from home and in danger, the Pack-Rat evidently fled for safety to one or the other of those outposts. Between them four entrance holes, then in use, went down into the earth; and there were also four abandoned holes.

Connecting the two outposts—the creosote bush and the choya—with the holes that were in daily use there were some much-used runways, as shown on the map; and each side of each runway was barricaded throughout its length with spiny joints of the choya. A few of the joints were old and dry, but the majority were fresh and in full vigour. We estimated that about three hundred cactus joints were in use guarding those runways; and no coyote or fox of my acquaintance, nor eke a dog of any sense, would rashly jump upon that spiny pavement to capture any rat.

Beyond the cactus outpost the main run led straight to the sheltering base of a thick mesquite bush and a palo verde that grew tightly together. This gave an additional ten feet of safe ground, or about twenty-five feet in all.

And yet there are men claiming to know things about the intelligence of animals who will assert in print that the four-footed animals are mere living machines, of no intelligence save in inherited knowledge, and unable to reason from cause to effect! Such views are held only by men who know very little of the wild animals of the world, either in their haunts or in captivity, and they are not worthy of serious discussion.

During our desert journeyings we saw about twelve nests of the Pack-Rat. I expected to find them absent from the lava region around Pinacate, but, *no!* they had persistently pushed up almost to the base of the ultimate cone. We took photographs of three or four, to show the various types.

Wherever choya joints were available, they were freely used, and sometimes they constituted the sole building material. Once while trying to shoot a mountain sheep, Mr. Phillips had a most disagreeable fall into a large rat's nest made of choya joints. His legs and hands gathered so many spiny joints that he was entirely unable to use his rifle, and the sheep escaped.

When choya joints are unavailable, the Pack-Rat makes its nest of dry sticks and other things. The establishment which I photographed on our way south from Wall's Well was of that kind. The site had been chosen where five or six rather large stones lay near together, and it seemed to us they were intended to render successful digging by a coyote an impossibility. The mass was five feet long, three feet wide and two feet high. It consisted of dry sticks from mesquite and creosote bushes,

and choya joints; and it had four entrances, all facing the south. It is the way of the Pack-Rat to use in its nest almost any loose material that comes handy—except grass! The latter it carefully avoids—quite as if aware of the fact that such inflammable material is not a good fire risk.

The White-Throated Pack-Rat is about twelve inches in length, of which the tail is one-half. It is larger and darker than the species farther west and also those farther east. Its upper body colour is a mixture of gray and light-brown tones, touched up with black, while its under parts and feet are white. Its range extends, so 'tis said, all the way from western Texas to the Colorado River, and therein I venture to say it is the most notable mammal below the size of a rabbit. It is eaten by the western red-tailed hawk, the coyote, the skunk and the Indian. Any hungry pioneer or prospector might devour it with as proper a sense of the eternal fitness of things as people manifest when they eat the smelly flesh of squirrels.

The beautiful little Desert Kangaroo Rat* is a habitant of the deserts only where there is sand, or earth sufficiently free from rock and gravel that his tiny little paws can win through it. He can live only where he can excavate, and carry up the material in his funny little hair-lined cheek-pouches. Inasmuch as each cheek-pouch holds, when loaded full, only half a teaspoonful of sand, it is quite certain that the industry of *Dipodomys* is really very great. With the camp shovel I once dug into the sandy Gibraltar of a Kangaroo Rat, and endeavoured to size up the plans

* *Dipodomys deserti.*

and purposes of the small architect. Although I chose a home ranch which occupied the entire top of a tiny natural mound, the sand was so loose, and caved in so persistently, that my best efforts resulted in but a hazy impression. It was quite impossible to make a map of the premises.

The dominant principle of a Kangaroo Rat's burrow is a bewildering labyrinth of large galleries, all connecting with one another, and with holes for ingress and egress on six or eight sides. Thus, no matter what be the direction from which *Dipodomys* flees homeward from an enemy, there is always a door ready to welcome him; and no matter which side of his fortress may be entered by a dangerous marauder, he can always fly out in the opposite direction.

The entrance holes are from two to four inches in diameter, but the internal galleries are much larger, varying all the way from five to eight or ten inches. The worst thing about them is their nearness to the surface. The roof of the average tunnel is only about six inches down, although they vary down to sixteen; and in clear sand both horses and men are continually breaking through into the galleries. Whether riding or walking, to be continually dropping with a jerk into big holes is far from pleasant. After half an hour of such pitfall work it begins to abrade one's nerves, and makes the victim wish that *Dipodomys* would either dig deeper or depart to a much warmer clime. Once when I was dragging and carrying a pack-mule load of firewood across a sandy plain, and suddenly plunged almost to my equator into a Kangaroo Rat's burrow, Mr. Phillips thought it very amusing,

and ha-hahed, and wished for his camera; but I saw nothing funny about it.

There is one thing about *Dipodomys* which can be predicated as a fairly immutable certainty. If he doesn't get water by lapping up the dew, or occasionally the rain, he doesn't drink at all! It is very certain that none of the burrowing rodents of the desert sands patronize the water-holes or the wells, for they have no means of reaching either. Rain or no rain, they must stand pat, and either extract moisture from their environment, or go dry. I think the heavy dew is the answer for them, but that would hardly seem sufficient for the mountain sheep, antelope and other hoofed animals.

I feel sure that the roots of the creosote bush must furnish the Kangaroo Rat with acceptable food; for otherwise, how could *thousands* of those small sprites exist in such a stretch of desert as that north-eastward of the Cerro Colorado, whereon there is absolutely no living plant or shrub save the creosote? It was there that the burrow mounds—each one surrounding an individual creosote bush—were so thick that there never were fewer than five in sight at one time. The stems of the bushes were not gnawed, and therefore, by elimination, we may reach the conclusion that the roots are fed upon. Unfortunately, there was no time to catch a specimen and investigate. In other places the burrows were thick in sandy spots wholly monopolized by galleta grass; and undoubtedly that plant fed *Dipodomys*.

It is unfortunate that the Kangaroo Rat is so strictly nocturnal. Were it like the sociable little chipmunk, we

would have seen hundreds, perhaps thousands, of them; but as they are, we saw only two. That was at night, when we were in camp at Child's Well, the last water on the road up to Gila Bend. After supper, as we sat quietly and reminiscently around the camp-fire, we were all suddenly hushed by seeing a little white ghost glide out from under the wagon, within five feet of Frank Coles, and pause near a bag of barley. I was astounded at seeing how very *white* it looked in the semi-darkness beyond our circle.

The little chap seemed quite indifferent to us, and went about his business of picking up grains of barley, and stowing them in his cheek-pouches, as calmly as if we had been logs of wood. Presently another came; and we watched the pair, spellbound. Not once did either of them stand up on its hind legs to survey its small world, but went on its four feet, as other mice do. Although they are called Kangaroo Rats, physically they are not in the rat class at all. They are distinctly feather-weight. A full-grown male is only about twice the size of a house mouse.

In captivity, a Kangaroo Rat lived in the Zoological Park for nearly three years. It was fed on the dryest of food, very rarely drank water, and as an exhibition animal it was a total failure. It never willingly showed itself in the daytime, but at night it came out of the concealment of its hay, and became quite lively.

Along the banks of dry arroyos, swiftly darting in and out of the mesquite clumps, we occasionally saw the Harris Antelope Squirrel.* In form, size and habits it is a desert

* *Ammospermophilus harrisi.*

chipmunk, no more and no less than a pale-gray relative of the common eastern chipmunk. We never saw it away from the banks of arroyos, where the greatest variety of plant life is to be found. It seemed to be a species of rare occurrence, and I think that throughout our four hundred miles of overland travel we saw altogether only ten or twelve specimens. Our first specimen was taken at Hayes Well, Coyote Mountain, and the last one seen was near Agua Dulce, in the Sonoyta Valley. Length, five and one-half plus two and one-half inches.

Of arboreal squirrels, belonging to the genus *Sciurus*, we saw not one, and I doubt whether one can be found between Tucson and the Gulf of California. The reason is not obscure. Save in the Sonoyta Oasis, there are no trees large enough to shelter tree squirrels.

Of hares and rabbits we saw only two species, the Arizona Cotton-Tail* and the Arizona Jack Rabbit.† But neither species was particularly abundant. There were a few places wherein four or five jacks might be scared up in going a mile; but they were rare, and the rule was about one jack to the mile, or none. The weight of an average male jack was four and one-half pounds. This species is well marked, even when running, by its tail, which is long, short-haired, *black* above and gray below. Half the time it runs with its tail erect, when it looks like a white-tailed species; but when it gently lopes off with its tail down, it looks its name. The greatest number we ever saw in one day was about thirty, and that was in the Ajo Valley, just north of Child's Well. I

* *Lepus arizonae.* † *Lepus californicus eremicus.*

could see no reason why they should be especially numerous there.

The Cotton-Tail Rabbit is small but persistent; and to coyote, hawk, badger, skunk and ocelot it surely is like manna in the wilderness. As *Lepus sylvaticus* spreads westward and southward, even into the savannas of South America, those who have followed it most closely have split it into numerous species and sub-species. In a museum, doubtless all those forms are distinguishable; but on the hoof, all Cotton-Tails look alike to me. Those that ostentatiously scurried across my bows in the desert looked sufficiently like the little imps that breed, and gnaw the bark of young trees in the Zoological Park, to have been their blood brothers.

There were times when Mr. Phillips and other members of the party became excited, and saw big *white-tailed* jack-rabbits, unlike the black-tailed species, so they said; but I saw none, and finally declared open war on the mythical other species which "might have been seen." Said Mr. Sykes, most pointedly,

"After this, gentlemen, let it be thoroughly understood that stories of white-tailed jack-rabbits don't go *unless you can produce the rattles!*"

A white-tailed jack-rabbit *may* inhabit that country, and probably does, since Mr. Phillips and Dr. MacDougal saw some; but no rattles ever were produced. There was not time enough.

We saw no living members of the Marten Family (which includes the otter, mink, weasel, marten, wolverine, skunk and badger); but we saw many badger holes,

which probably represented Berlandier's Badger. As already noted, some fresh fragments of a large species of skunk, probably *Mephitis macroura*, were found on Cubabi Mountain, near Sonoyta. It is to be understood, however, that we saw on our hurried trip only a very few of the mammalian species which undoubtedly inhabit that region, and which a longer residence would disclose.

Of the larger animals known to inhabit the region we traversed, a brief summary possibly may be useful to someone; but it must be remembered that our tour of observation embraced only the month of November.

The Coyotes, like the poor of holy writ, were with us always. They serenaded us at Roble's Ranch (our first camp), they ran through our camp at Agua Dulce, and they ruined Mr. Phillips' finest mountain sheep on the lava within two miles of Pinacate Peak, at an elevation of about 2,500 feet. At the eastern edge of the lava a sick—or discouraged—coyote disdained to take me seriously, and at Quitovaquita two of the gray brothers lay dead. Out of the ruck of thirteen "described" coyotes I must confess I am unable to pick the species that so often entertained us, nor does its exact sub-specific gravity matter very greatly, except that by reason of its cold gray colours it did *not* appear to be Mearns Coyote. It was distinctly smaller than the Montana Coyote, but no other difference was discernible in November specimens.

Of the puma, we saw not a trace; and bears of all kinds were equally absent.

While we were at Pinacate Peak and the Tule Tanks Jess Jenkins and George Saunders, who were holding

down the camp at the Papago Tanks, saw a strange animal in the vicinity of my work-table, but it was impossible to identify it from their description. It may have been a "bob-cat" (lynx), or it may have been an ocelot.

Of Prong-Horned Antelope we saw not one in Arizona, and none in Mexico until we reached the eastern edge of the great Pinacate lava district, where we found six individuals. Later on, Mr. Phillips saw two specimens in that same spot, and killed both, for the Carnegie Museum. About thirty antelopes were seen at the edge of the sand-hills, at the south end of MacDougal Pass. On our way from the Papago Tanks to the Tule Tanks we found on the lava plain a band of five antelopes, two of which were killed by Mr. Jeff Milton, as previously described. Altogether we saw about forty-three individuals.

Of the three male specimens killed (and preserved) two were true to the standard type of *Antilocapra americana*, but the third had such a queer mane on the nape of its neck that if taken quite alone it might possibly tempt a hair-splitting classifier to call it a new sub-species. But in view of the characters of the other specimens taken in the same locality, such a determination would be untenable, for it is evident that the variations noted were purely individual.

Antelope once were plentiful in Arizona along the course we travelled, but the deadly long-range rifle has completed its work, and to-day all are gone.

In a dozen localities which should have contained deer, we hunted deer quite diligently but found two only, at the foot of Cubabi Mountain, near Sonoyta, one of which I

shot and sent to Dr. W. J. Holland, at Pittsburgh, for the Carnegie Museum. That species was Coues Deer,* a very small member of our White-Tailed Deer group.

The only trace of the Desert Mule Deer† seen by us was a single antler picked up at the Papago Tanks, about fifteen miles from the shore of the Gulf of California. Throughout the Sonoyta Valley the species has been exterminated, chiefly through the efforts of the Papago Indians, who are diligent hunters.

Of the Collared Peccary or Javalina (called "Hav-a-le' na"), we saw not one. Charlie Foster still asserts that they inhabit Cobabi Mountain, south-east of Sonoyta, and with him as a guide Mr. Phillips made a fiercely vigourous hunt for them the day before we left Sonoyta for home; but the hunt was a blank. The Peccary is fairly common in the Santa Catalina Mountains, near Tucson, and since our visit Dr. MacDougal has had a very successful hunt for them, finding a good number, and bagging two fine specimens.

The Mountain Sheep of Mexico will be spoken of in a separate chapter.

**Odocoileus couesi.* †*Odocoileus hemionus eremicus.*

CHAPTER XXIII

NOVEMBER BIRD LIFE IN THE LAND OF LITTLE RAIN

The Disappointing Road-Runner—Gambel's Quail and Its Pursuit—The Wisdom of the Cactus Wren—The Crissal Thrasher's Nest—Western Red-Tailed Hawk—The Red-Shafted Flicker—Nests in the Giant Cactus—The Crows at the Papago Tanks, and a Murder—Doves—A Bittern Fishing—The Mud Hen of Sonoyta—Scarcity of Reptiles in November.

On the whole, I think that the volume of bird life between Tucson and the Gulf was greater and also more interesting, than any of us expected to find it in November. Of course it greatly surpassed the mammalian life; but that was to have been expected. Thanks to his wings, the bird is much more of a free moral agent than the mammal. If his environment fails to come up to his expectations, he can "quit the country" and try his luck elsewhere; but with the average mammal smaller than a deer it is a case of "root, hog, or die." He must stand fast and take the heat and thirst as it finds him.

In considering my hurriedly-made bird notes, it should be made known to the Reader that we saw perhaps twenty species of small birds which we could not possibly identify without killing some of them; and we were not disposed to shoot many of our feathered friends for that purpose. Already there have been killed in America

too many millions of valuable birds for no other reason than to make zoological holidays, and possibly to label their skins and put them away in evil-smelling drawers.

Of the bird life that we saw in the South-west, to me the most surprising thing was the scarcity of the Road-Runner.* Besides being surprising, it was a distinct disappointment, for I had long looked forward to an association with that gay and festive bird in its native land. Throughout our whole trip I saw only two individuals. One was in the suburbs of Tucson, and the other was in the Sonoyta Oasis; and all they did was to run with long strides into underbrush, and disappear.

Beyond doubt, the Road-Runner is a bird of strange and erratic personality, as anyone may see in any well-equipped zoological garden. The long, strong and capable feet and legs of that feathered oddity were made to carry it through the world; and right well do they perform their duty. From this bird's cradle to its grave life goes with a hop, skip and jump, all without visible effort, and seemingly as if done by automatic machinery. A Road-Runner will propel himself to the top of a four-foot stump by leg-power alone, without even a flit of a wing, and as easily as if it were done by a steel spring.

In New York we have Road-Runners a-plenty in captivity, but for "showing off" they lack the natural race-course plains of the South-west. I longed to see one of them run a mile at top speed, and to learn something of their mental traits; but it was not to be.

Mr. Howard Eaton writes me that he once saw three

* *Geococcyx californianus.*

Mexicans chase a Road-Runner for about three hundred yards, when it was driven into a mesquite bush, and caught unhurt.

Strange to say, the Road-Runner is related to the cuckoos. Many persons think it is a "game bird," and related to the grouse, but it is not. Its queer, attenuated form, long and strong legs and powerful feet are fit indexes of its strange mentality and habits, and I heartily wish it were more numerous.

Although Gambel's Quail* was plentiful throughout all save the lava-land portion of our trip, Mr. Phillips found it impossible to shoot that shrewd little bird in the usual way of the sportsman. For example: A covey of from eight to fifteen birds will reveal itself close by the roadside, and every bird will sit tight, behind his mesquite or other bush, until the hunter is really close up. Then you hear a sweet-voiced little command, saying in dulcet tones, "Sweet! Sweet! *Quit-quit!*" and a few seconds later they begin to run.

Gun in hand you stalk up to flush the flock, in order to take the birds on the wing, as a real sportsman should. But they will not rise! With heads and necks held stiffly up, and plumes pointing forward rudder-like, as if to steer their course, they run and dodge to and fro over the bare ground between the bushes, in a most tantalizing way. If you force any of the birds to rise, three or four will fly up, about four or five feet only, but not nearly high enough to clear the tops of the bushes, and after a flight of only a few yards, down they go again into the sheltering arms

* *Lophortyx gambelii.*

of the brush. Now and then you can see a bird gliding for a brief instant across an opening, to be swallowed up the next; but if you rely solely upon wing-shooting, you may go away empty-handed and vexed.

After his first two hours' shooting at Gambel's Quail on the wing, and the expenditure of many cartridges, Mr. Phillips returned to the wagons red in the face, hot and vexed, with only two birds! And yet he is an exceptionally skilful wing-shot.

"The blamed little beggars *won't rise!*" he wrathfully announced, as one who has been treated unfairly.

"Of course they won't!' said the Doctor cheerfully. "You've got to shoot them as they run on the ground in order to get any; and you will have to shoot mighty well to get many, even in that way. On these deserts it isn't in good form for a quail to rise and fly clear of the bushes."

John M. saw a great light, and his tactics changed accordingly. We saw hundreds of quail, and on some days Mr. Phillips killed one for each member of the party. When alive, Gambel's Quail is both beautiful and interesting. Kill it and cook it, and it is a "tajous" bird. Only idle people can afford to eat it regularly. I think a man like Mr. Sykes, or the Doctor, or Mr. Phillips could starve to death on an exclusive diet of those small birds. No sooner do you begin to grow interested in one of them than it is gone; and there is mighty small nourishment in the memory of a has-been.

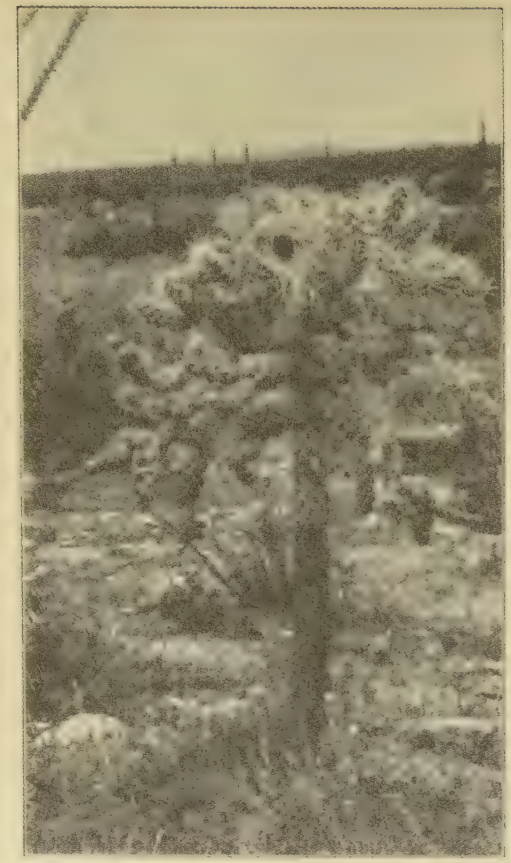
In the books and museums—but nowhere else—Gambel's Quail becomes "Gambel's *Partridge*," because the dear old fossiliferous A. O. U. has solemnly so elected;

but on the deserts wherein the bird lives, that fiat is a very dead letter. The bird is a plumed understudy of the more beautiful valley quail—or "partridge"—of the Pacific coast. Owing to the wide dispersal of this species throughout vast tracts of arboreal desert, the scarcity of hunters and the delightful cost of cartridges, it will be many a day ere it is seriously threatened with extermination. Indeed, it would not be surprising if Gambel's Quail were the last upland game bird of the United States to be completely annihiliated under the grinding hob-nailed hoof of "civilization." We found it along our route all the way from Tucson to the lava-fields, and one covey was seen upon the lava.

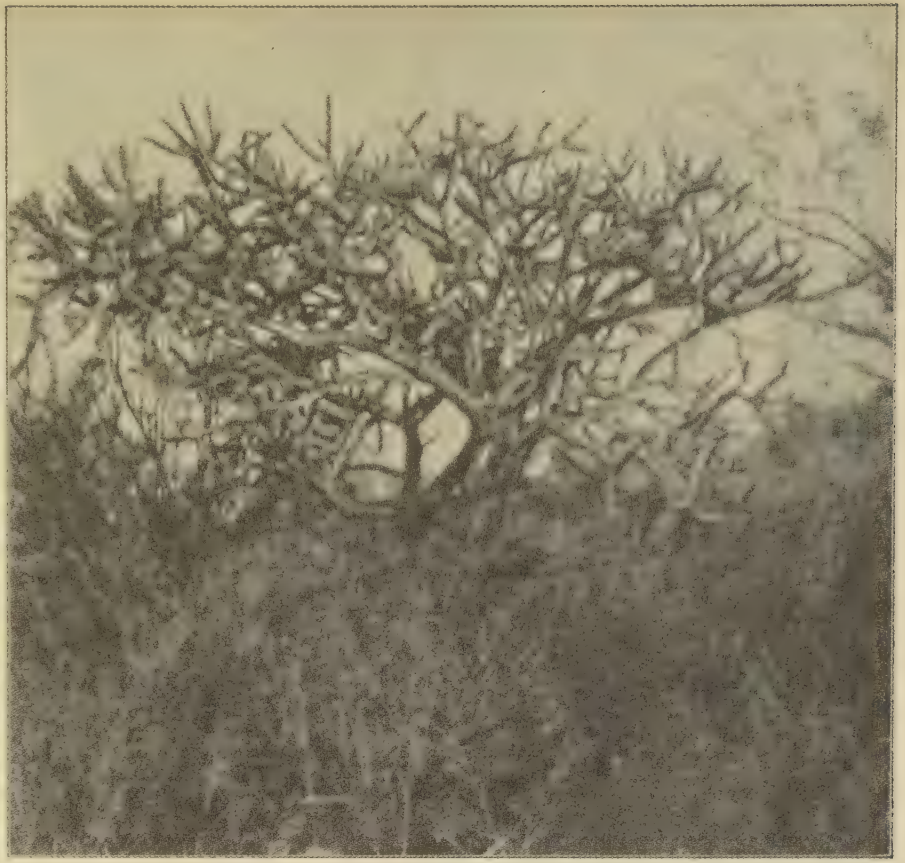
On leaving Tucson over the westward trail, the nests of the Cactus Wren* attract immediate attention. I have it down in my notes of November 2nd, that "we saw about twenty-five nests in the tree-choya cactus, but none in bushes." Now perhaps this was a string of coincidences. Perhaps the Cactus Wren cannot and does not *reason* from premise hawk to cactus-spine conclusion; but there are men in Arizona and in New York also who believe that it does, and can show good cause for doing so.

Every reasoning being knows full well that it is far more difficult, and also more disagreeable, to build a nest in the geographical centre of a tree choya, encountering the while about two thousand wicked spines, than it would be to build in a mesquite or a palo verde. Anyone who will deny this is simply hopeless. This being true, it is impossible to imagine a bird building in the most difficult

**Heleodytes brunneicapillus.*



Tree-Choya Cactus, Containing the Nest of a Cactus Wren



A Cactus Tree of the Desert Botanical Garden

and painful place without a *reason* for doing so, and much more of a reason than the mechanical example of an ancestor. Birds are not *dull* in adapting themselves to new conditions! The robins of Gardiner's Island, New York, very quickly learned that the absence of cats and bad boys rendered it perfectly safe to build within two feet of the ground; and most certainly there was in that neither instinct nor example, but precisely the reverse! It was reason. They formulated a theory, tried it and found that it was correct.

In many cases we were puzzled to understand how it is possible for a Cactus Wren—which is fully three times the size of an ordinary house-wren—to penetrate to the interior of a tree choya, and build an elaborate nest in a space that seems hopelessly small. But the little brain of that small feathered creature contains at least one concrete idea—the survival of the fittest; and to him there is none so fit as himself. The unwise birds who builded in the bushes have (apparently) been exterminated by the hawks, long ago.

The nest of the Cactus Wren seems to consist of long, straight stems of fine grass, and without the entrance hole each home looks as if someone had carefully pushed a big handful of dry stems of blue-grass into the centre of the tree-choyas' spiny top. The bird itself does not look in the very least like the pert and coquettish house-wren of our boyhood days—now rarely seen where the accursed English sparrow predominates. It looks more like a long-billed dark-gray thrush than a wren, and it carries its tail pointing below the horizon. For all that, however, it is

a very interesting bird, and we wish it a million years of longevity.

There are other birds besides the Cactus Wren which know a safe nesting-place when they see it. Within a stone's throw of Dr. MacDougal's spacious and inviting veranda in Tucson, a Crissal Thrasher* has nested in a large tree choya which has been grown on the grounds. This Thrasher is closely related to the cactus wren, but when not sociably haunting the habitations of men it is usually found in rocky arroyos, or cañons.

By way of variety, the Western Red-Tailed Hawk† occasionally builds its nest in a giant cactus. Of course it may be that the nest of a hawk is not so placed for safe-keeping; for it would seem as if every Red-Tail can fend for himself. The court merely notes the exception.

I think we saw about fifteen hawks of this species—broad of wing, stately in flight and imposing at rest on tall cactus or dead mesquite stub. Dr. MacDougal shot one on the Sonoyta River, at Agua Dulce, in order that we might identify it and ascertain its food habits in November; but its stomach was empty.

I have already mentioned the death of a Western Horned Owl‡ in the level plain of the Cubo Valley. Others were heard at night in the Sonoyta Valley.

North of the international boundary, where the giant cacti grow tall and wide, the Red-Shafted Flickers§ drill them where they list, and nest in them. The digging is easy, the interior is hospitable, cool and moist in the fierce

* *Toxostoma crissalis.*
† *Buteo borealis calurus.*
‡ *Bubo virginianus pallescens.*
§ *Colaptes cafer collaris.*

heat of summer, and for a nesting-place nothing more is required. Of those conspicuous and attractive birds we saw many—perhaps twenty-five or thirty; and they seemed to be enjoying Arizona as greatly as we were. We were then about on the southern boundary of that species, which does not go far below the international demarcation.

From the hour that we left Tucson I watched for the Phainopepla, and was rewarded by seeing five flocks, with about eight or ten birds in each. They occurred at wide intervals, from the Cubo Valley to MacDougal Pass, within eighteen miles of the Gulf of California. In manner they were not at that time phenomenally interesting; for they just sat. In appearance they were very much like small blue-jays dyed blue-black, or dark purple. You recognize it most easily and surely by its jaunty crest and its long, square-ended tail. The white markings on the wing feathers are not visible when the bird is at rest. This is the bird which in the breeding season loves to cut capers in mid-air, such as dropping suddenly and swiftly from on high. In November, however, the Phainopepla, as we saw it, is quiet and undemonstrative, even unto dulness.

Ravens were omnipresent, and I think that on several occasions we saw Crows, also. We killed none of either species, however, and there were times when it was impossible to tell when the Crows left off and the Ravens began. Now, at the Papago Tanks, some of the Ravens that flocked around the mountain-sheep works were so small I am even yet in doubt about their real identity.

They were so very tame and trustful of us that we were unwilling to kill one. It was not that a Raven could not very well be spared from the flock of thirty or forty that hung around my work-table, and ate the meat-scraps that we gave them; but we were unwilling to kill any bird that had trusted to our honour to the extent of placing his life in our hands. They came almost fearlessly within fifteen yards of us.

But, alas! In spite of the example set by four of us, a murder was committed. While we were away at the Tule Tanks and Pinacate, leaving Jess Jenkins and George Saunders to watch the camp, one of those men actually broke the compact, and killed a Raven, close to my table. The result was that *every Raven immediately left that camp, and returned no more!* On our return we found the camp quite silent and deserted, and immediately asked what had become of the Ravens. Then the wretched story came out; and we were much displeased by the blot on our escutcheon.

A few Golden Eagles were seen, perhaps half a dozen in all, but not a white-head was noted. At the Papago Tanks Mr. Phillips saw a flock of about twenty Doves that came down in the evening twilight to quench their thirst. To my great surprise, Doves of all species proved to be very scarce between Tucson and the Gulf. I did not see more than a dozen indiv duals, all told, and those were Mourning Doves, such as some misguided sportsmen in California, and also some portions of the South, hunt and kill as "game." Great "game" indeed are they; and mighty hard up for "sport" must be the men who seriously

hunt them! The American farmer can ill afford the loss of such valuable allies in the war on weeds.

On our return from the Pinacate country, the last waters of the Sonoyta River sank into the sand opposite the Playa Salada, near Agua Dulce. The last struggling pools were fairly swarming with minnows, all of which were doomed to quick annihilation by the drying-up of their home waters. It was there that I noticed an American Bittern* fishing for dear life. He had what may well be called a cinch; for the devoted minnows were quite at his mercy. He worked as if he had taken a contract to catch all those 565 minnows, and place them where they would be of some benefit to the world, before the receding waters could leave them wasting their sweetness on the desert air. I was so pleased to see Botaurus that I was tempted to go over and shake hands with him, and ask him when he left "the States."

It was at Sonoyta, on the day before our departure for Gila Bend, that I was treated to a most unexpected acquaintance with a bird of rare mental poise. While we were encamped on the north bank of Sonoyta River, squaring accounts with the native purveyors of horses, hay and wagons, I followed the good example of the Doctor and Mr. Phillips to the extent of taking a bath in the stream. At that point the stream bed was so narrow that between banks it was not more than fifteen feet wide.

The banks were completely masked by bushes, and on the south side the jungle growth was quite dense. Choosing a tiny bank of clean sand, I quickly took my pour-

**Botaurus lentiginosus.*

bath—of water that was fearfully cold—and without any undue lingering proceeded to dress. In that operation there was no need for haste, and it proceeded slowly and in dignified silence. I stood on my little sand-bank facing the stream, and had reached thirdly, when to my amazement a slaty-blue bird silently walked out of its concealment under the roots of a mesquite tree. It was an American Coot, or Mud-Hen,* and after it had calmly looked me over, and waded out into the shallow current, it was so near that I could have touched it with a carriage-whip.

I stood fairly spell-bound with surprise and pleasure, and decided to give the stranger a time exposure, to see what it would do. It was very evident that the bird was fully aware of my existence, for it frequently cocked its head, and looked me squarely in the eyes. But it was by no means disposed to lose valuable time in speculating upon the intentions of a total stranger. Slowly it walked up stream, where the current was only three inches deep, sharply looking from side to side for aquatic insects, or anything else worthy of a Coot's serious attention. It was in no more haste than a sloth, but went slowly and solemnly, stalking for prey.

Gradually it drew away from me, and when, at last, I felt compelled to continue my dressing operations, the bird watched me without the slightest manifestation of alarm. We "took stock" of each other, to the last available moment; and I really believe that when I again see that Coot I will know him at sight. He has a whitish bill,

**Fulica americana.*

a very bright eye and scalloped toes, by which tokens I can recognize him anywhere.

Finally I spoke to him quietly and gingerly, as a gentleman always addresses a stranger when there has been no formal introduction. My advances were received with brisk confidence, and caused no alarm. When the daylight was about to be turned off, I climbed the bank and left Fulica still stalking silently up the stream, seeking what he might devour, but not at all like the roaring lion of holy writ.

The reptilian life observed during our outing to Pinacate cut a ridiculously small figure. The reason for this was not entirely clear, for although the nights were cold, the days were warm enough to justify any Arizona reptile in pursuing the even tenor of its way.

We saw no Gila Monsters, no Collared Lizards, no Spotted Lizards, no Sidewinder Rattlesnakes—which I ardently longed to obtain alive—and only three Rattlers, all told. I saw about eight Horned Lizards (which are universally known as Horned "Toads"), one of which was on the lava field. The latter was dark brown, like the lava. It was my plan to collect some of those lizards on the return journey, alive—and then by ill luck we saw only one more specimen. That was captured for me by the Doctor, and placed in one of the dark caverns of his multi-pocket hunting-coat, after which it never again could be found. He said it escaped; but I believe it is still there.

We saw a few small lizards, of no special colours, inhabiting clumps of creosote bushes, three Texas Dia-

mond-Backed Rattlesnakes, as already mentioned, and one dreadfully emaciated Frog, which came up out of Wall's Well in a pail of water, mighty thankful for the deliverance. We saw no other serpents of any kind, no tortoises or terrapins, and no amphibians save the Frog mentioned above.

The reader must not infer, however, that we saw anything like a proper representation of the reptilian life of that region *as it appears in spring and summer.* Undoubtedly the Sonoyta Valley must contain quite a number of species of serpents and amphibians of which in November we saw nothing. I am not attempting to do more than to mention the wild creatures that were still afoot at the beginning of the winter season, when bird life and reptilian life are both at a low ebb.

CHAPTER XXIV

THE MOUNTAIN SHEEP OF MEXICO

Bird's-eye View of the Genus *Ovis*—Its Vanishing Point at Pinacate—Straight *Ovis canadensis*—The Making of a New Form—Colours—Size—The Feet—The Pelage—The Horns, Skull and Teeth—Habits—Geographical Distribution in Mexico—Summary of Facts and Conclusions.

TARDILY and slowly, the mountain sheep of old Mexico are being discovered and disclosed to the world. They are keenly interesting, because they represent the end of the great chain of sheep which stretches almost without a break from the aoudad of the Barbary States of north Africa to its jumping-off place at Pinacate and in Lower California. The series runs in the following order:

Aoudad, monflon, arcal sheep, burrhel, Thibetan argali, Marco Polo's sheep, Siberian argali, Kamchatkan sheep, white sheep, black sheep and big-horn. Of course this brief enumeration does not take into account several other species, and numerous sub-species, some of which require careful study.

It is my belief that the mountain sheep, genus *Ovis*, originated in the Altai Mountains of western Mongolia, and from that centre radiated in three directions. One of the offshoots went southward into the upper regions of Hindustan, another south-westward to the Barbary States,

and the most vigorous of all spread northward toward Bering Strait. It seems beyond reasonable question that the genus easily crossed Bering Strait, then bore away southward along the various west-American mountain systems, producing in turn the white sheep of Alaska, the black sheep of northern British Columbia, the big-horn of the American Rockies and the Mexican sheep of northern Chihuahua.

In north-western Sonora we found ourselves at the vanishing point of the genus in America. As we will point out later on, a few pioneers of *Ovis* have been seen at a point on the mainland opposite Tiburon Island. In Lower California it exists more than half-way down the peninsula. To the zoologist, the vanishing point of a great mammalian genus, with a range that half encircles the globe, is an interesting field for observation.

For all present purposes at least, we may say that at Pinacate the genus *Ovis* is finally vanquished by the great desert barrier known as the Sonoran Region, where the heat is fiercest, the food is scarcest and the water supply is either very scanty, or non-existent. We have before this seen, and attempted to set forth, the Big-Horn species (*O. canadensis*) at its culminating point, in south-eastern British Columbia. Judge, then, the interest with which we hunted, shot, dissected and preserved adult specimens of the same species at the point where it throws up the sponge to the torrid terrors of the Sonoran deserts. And what did we find?

In the first place, the Mountain Sheep of Pinacate is

Heads from Pinacate

1. The Author's "Curiosity" ram, (No. 2)
2. Mr. Phillips's "Rattled" ram, (No. 3)
3. The Author's first ram
4. Dr. MacDougal's ram
5. Mr. Phillips's Prong-Horn buck
6. Mr. Milton's Prong-Horn buck
7. Mr. Phillips's second ram

the straight, old-fashioned Big-Horn—*Ovis canadensis*—no more and no less. This makes it far more interesting than if it had already differentiated, through isolation, into a new form. Those animals are now so nearly isolated that structural changes, reproduced by the inbreeding that undoubtedly is going on, are hard at work upon them, attempting to mould them into a different form from the typical parent stock.

By reason of a very scanty food supply in the dry seasons, little water, long periods of thirst and undoubted suffering from the fierce heat of summer, the Big-Horn of Pinacate is to-day distinctly smaller than his brothers in Wyoming, Montana and British Columbia. His hair is very short, thin and stiff; his feet are much smaller; his tail is very long (ten caudal vertebræ) and ridiculously short-haired; his weight is from fifty to seventy-five pounds under the northern average. His horns often become so dry and brittle that large patches scale off from their surfaces and materially reduce their diameter. It is quite worth while to consider these characters separately, taking them in the order of their importance.

Colours.—Among the seven Mountain Sheep of Pinacate that we killed in November, three others killed in Wyoming in November, three taken in "Goat Mountain Park," British Columbia, in September, and several winter-killed heads from Banff, now in my possession, I have been unable to detect any colour variations that are noteworthy. In any given locality, the colours of the sheep that inhabit it show numerous trifling individual variations. The noses of the freshly mounted heads from

Pinacate *to-day* are whiter than some of those from British Columbia; but it is probable that a good washing of the latter would wipe out the trifling differences that seem to exist.

I expected to find the pelage of the Pinacate sheep bleached out by the heat, and strongly inclined to gray tones, or the salmon pink of the sheep killed by Nelson in July in the Funeral Mountains; but we found nothing of the kind. The smoky-brown colours of our new specimens were just as deep and rich as they were on the British Columbian specimens; and from head to tail-tip the colour pattern was precisely the same. The only specimen which showed anything approaching a difference in body-colour was the "old residenter" whose entire skin was sent to the Carnegie Museum. His body-colour was, *through age*, not quite so deep as it was on the other six which passed through my hands. I preserved the pelts of two, for general reference, and they are available in the Carnegie Museum. The colours of the heads taken by Messrs. Sampson and Litchfield on the Peninsula, opposite Pinacate, in November, are precisely the same in colour, pelage and horns as our specimens, and I think are *Ovis canadensis*.

Size.—It is under this head that a noteworthy difference appears. The dimensions of the Mexican "Carnegie Ram" tell the story, especially when set down in comparison with those of specimens from farther north. In everything save weight it was a large specimen—for Pinacate. Owing to its extreme age—as shown by the fearfully worn condition of its incisors, it had fed with difficulty

and was positively thin in flesh. Had it been five years younger, it very probably would have been forty pounds heavier.

DIMENSIONS OF ADULT MALE BIG-HORN SHEEP, FROM THREE LOCALITIES

	Pinacate, Mexico.	Wyoming.	S.-E. Br. Columbia.
Age	13 years?	7 years	13 years
Height at shoulders	37 inches	40 inches	41 inches
Length of head and body	54 inches	58 inches	69 inches*
Girth behind fore leg	47½ inches	44 inches	53 inches†
Circumference of muzzle	11 inches	12 inches	12 inches
Circumference of front hoof	8½ inches		10⅝ inches
Tail, length to end of vertebræ	5 inches	3 inches	
Weight	192½ lbs.		316 lbs.

I do not mean to say that the Pinacate sheep recorded above was an extra-large specimen, but I do think that, like the two recorded from farther north, it was above the average. The first ram that I shot *seemed* to measure larger; but it was measured under serious disadvantages, and the chances for error were so numerous that I think it best to leave the figures unpublished. Unfortunately, also, my scales were not available at the right time to ascertain its weight; but it was at least forty pounds heavier than Mr. Phillips's first specimen, recorded above.

The Feet.—The feet of one of our largest Pinacate sheep (preserved and brought home) are very noticeably

* Evidently not measured as were the other two specimens, both of which were measured by the author.

† Probably distended by gas.

smaller than those of Mr. Phillips's "Carnegie Ram" from British Columbia. Note the following differences in measurement:

	Pinacate Ram.	British Columbia Ram.
Greatest circumference of front hoof.....	8½ inches	10⅝ inches
Greatest width of front hoof.....	2½ inches	2¾ inches
Greatest length of front hoof.....	3 inches	3½ inches

In general bulk, with the two hoofs upturned side by side, the foot of the British Columbian ram seems at least one-quarter larger than the other. The under surface of the former shows no particular wear from the rocks, and is just as Nature made it,* whereas the bottom of the Pinacate hoof has been quite worn by continuous contact with the sharp lava, and the points of the toes have been rounded upward as if with a rasp. The cup-shaped form of the northern hoof has totally disappeared from the southern hoof, and the bottom of the latter is quite flat and hard; all of which is precisely in line with what might be expected from life on the lava.

The Pelage.—As before remarked, the hair of the Pinacate sheep is thin, short, stiff and dry, and next to the skin has practically none of the fine, woolly hair that is often found on specimens farther north. It is only about one-half the length (or less) that one finds on the mountain sheep of Wyoming and British Columbia in November. It resembles the coat of the monflon much

* See "Camp-Fires in the Canadian Rockies," page 102.

more than it does that of the Big-Horn. As a result, the mounted heads of our sheep seem to have very small and poorly nourished necks, quite unlike those of British Columbian sheep. Of course the necks are small, but the scanty pelage is half to blame for their extra-small appearance.

The Horns.—It is under this head that nearly all big-game hunters become keenly interested. We were exceedingly fortunate in finding fully adult rams with large horns. Of the seven rams shot by our party, four carried extra-large horns—for American mountain sheep, anywhere—as the following table of measurements will show:

HORN MEASUREMENTS OF FIVE PINACATE MOUNTAIN SHEEP

All as measured in inches, in November, 1907, when fresh.	J. M. P. No. 1 "Museum Ram."	J. M. P. No. 2 "Sykes's Ram."	J. M. P. No. 3 "Rattled Ram."	W. T. H. No. 1 "Running Ram."	W. T. H. No. 2 "Old Curiosity."
Age, in years	13	5	10	7	11
Circumference at base	15½	14⅞	15	17	15⅛
Circumference 18 in. from base	14½	small	13	8¼	12
Circumference 1 in. from tip	5½	3¼	6	3¾	5¾
Length on outer curve	37¼		36	29½	33
Widest spread, outside			20½	20½	20
Spread between tips	16½	22	19	19¼	14

From these measurements it will be noted that the horns of four out of the seven rams taken by our party were *much larger in proportion to the stature of the wearers than are the horns of other North American sheep.* The food of the Pinacate sheep must contain an unusual proportion of horn-producing material. And yet, the horns of the three oldest rams were reduced in basal circumfer-

ence by the flaking off of particles, through the excessive heat and dryness of that region, probably supplemented by fighting. One pair of horns had around the base of each a ring of dead and disintegrated horn material which still was held by the hair, showing that the weathering process proceeding before our eyes had actually reduced the basal circumference of each horn by at least an inch! The horns of the young rams were quite normal, and free from this deterioration.

In their form, there is not in any one of these horns a single feature of difference between them and the horns of northern Big-Horns save bulk and tropical dryness. The same may be said of the nine heads collected by Litchfield and Sampson. Taken by themselves, they seem big, and imposing; but hang the largest of the three heads listed above beside the giant Banff head presented by the writer to the National Collection of Heads and Horns, and they seem positively *small!* My seventeen-inch head seems almost ridiculous by the side of the monster whose horns measure only sixteen and one-half inches in basal circumference; for in the former the horn material is concentrated in the base, while in the latter the base is really small in comparison with the immense bulk beyond it. This is a very striking illustration —and I hope all my readers will remember it—of the great folly of judging sheep horns on their basal circumference alone. There are *four measurements* that should be compared before deciding which specimen is really the largest and "the finest."

None of our sheep horns were seriously broken or

"broomed" at their tips, but three were badly scarified on their upper surfaces, where they strike together when fighting. The horns of the old rams were very dry, and in fighting head to head large scales of horn evidently had been flaked off by the blows they had received. This was particularly noticeable on the horns of Mr. Phillips's Ram No. 3, the circumference of which had been materially reduced. Evidently that dry atmosphere acted upon those horns quite as it did on our finger-nails, which were so dry that they broke at the slightest touch of excuse.

The horns of Mr. Phillips's Ram No. 3 (the "Rattled Ram") grew completely together on the top of the skull, not a shred of skin remaining between them. Owing to scaling off of large pieces from the top of the right horn of this specimen, it shows with remarkable clearness the process by which the horn of a mountain sheep is formed. It is as follows:

Every sheep horn is built over and supported by a long and large wedge-shaped mass of porous bone called familiarly a horn-core. It is very large at the base, and about one-third of the way out toward the tip of an adult horn it terminates in a blunt, wedge-shaped point. Each year the horn material is poured out all over the outer surface of this horn-core, pushing out the already-formed horn as it accumulates, until it forms a complete sheath over the horn-core. In the north, this growth takes place in the spring, summer and autumn months of the year, and in winter, when food is scarce, it halts. On most sheep horns, the winter period is marked by a dark and sometimes deep crease. It is reasonable to suppose that

in Mexico the sheep make their horn-growth in winter, when the food is freshest and least parched by heat, and water is most abundant.

The right horn of Mr. Phillips's ram shows, with de-

Left Horn of a Pinacate Mountain Sheep.

Owing to scaling off, through heat, dryness and fighting, the annual rings of growth are particularly well shown. Note the manner in which one cornucopia of horn has grown within another.

lightful clearness, the manner in which a whole series of annual cornucopias of horn material have successively grown into one another, and regularly pushed the old horn outward farther and farther from the horn-core. The progress of the horn year by year is quite unmistakable, and is clearly shown in the accompanying illustration.

Skulls, Dentition, etc.—I have compared the skulls of all the specimens mentioned above, and also a skull from the collection of Messrs. Litchfield and Sampson, with several skulls of *Ovis canadensis* from British Columbia, and have found no real differences. The profiles, dentition, length of tooth-row and everything else seem identically the same. In view of the four new species and subspecies that have been created for south-western Mountain Sheep—some of them I think on slight provocation—it is rather interesting to find that the sheep of Pinacate, and of Lower California directly opposite, are genuine *Ovis canadensis*—formerly called for half a century *O. montana*.

Habits.—All that we know to-day of the ways of the Pinacate sheep can be written in a few words.

I found in the stomach of the first ram shot the following food plants:

Galleta grass, palo verde (*Parkinsonia torreyana*), white brittle-bush, flower-stalks only (*Encelia farinosa*), "torote prieto," *Terebinthus microphylla* and *Sphæralcea*.

Owing to the scarcity of other food, I think it extremely probable that the species named above are fed upon throughout the year. Beyond doubt, they eat the fruit of all species of low-growing cacti, and mesquite beans whenever any are available. The sheep are much in the habit of bedding down and resting in deep niches in the lava, evidently to escape the glare and heat of the sun. In south-eastern California, Mr. Will Frakes found that the sheep of those desert mountains are in the habit of seeking the water-holes at night, to drink. He says that they are very much on the alert, sleep fitfully and

awaken about every fifteen minutes to look about for enemies. Up to this date, Mr. Frakes has caught seventeen sheep, chiefly by means of steel traps set in their trails, but thus far none have bred in captivity. They are nervous animals, and during the first month that they are handled by men they are prone to dash about and injure either the keepers or themselves, or both.

Mr. Frakes states that the scourge of the sheep in captivity is pneumonia; and that when once that disease is fairly established, it is well-nigh impossible to cure it. Even on its native mountain-top, a captured sheep often takes cold and contracts pneumonia within a few hours after its capture.

Geographical Distribution in Mexico.—Beginning about one hundred miles below the international boundary, and extending two-thirds of the way down toward its terminus, the mountainous peninsula of Lower California is inhabited by bands of mountain sheep. Dr. MacDougal saw several sheep in the mountains only eight miles inland from the barren and uninhabited spot marked San Felipe, near the head of the Gulf.

In 1895, near the north end of the northern range of San Pedro Martir Mountains, about Latitude 31°, Mr. George H. Gould, of San Diego, killed a magnificent ram whose head is now historic. It is not only by far the finest that ever has come out of Mexico (s. f. a. k.), but it is also one of the finest heads ever taken in North America by a sportsman. Its measurements are as follows: Circumference, 16¼ inches; circumference eighteen inches from base, 13 inches, and one inch from tip, 4¾ inches; length

on curve, 42½ inches; spread, 25¾ inches. This head has been presented by Mr. Gould to the National Collection of Heads and Horns, and is now at the Zoological Park. It appears to be straight *Ovis canadensis*.

In November, 1907, while we were hunting sheep on the Pinacate lava fields, Messrs. Henry Sampson, Jr., and E. H. Litchfield, Jr., were similarly engaged on the Peninsula, north-westward of us. They had excellent success, and bagged eleven rams, some of which were fine in horns, but, like all of ours, poorly provided with pelage. Sheep are found within measurable distance of San Quentin, and it was somewhere inland from that port that the late William Harriman found a mountain-sheep lamb, on a Mexican ranch, purchased and successfully shipped it to the New York Zoological Park. It lived in New York about six months and presently succumbed to the great scourge of captive wild sheep—pneumonia.

Mr. George F. Norton, of New York, recently hunted sheep about seventy miles eastward of San Quentin, but found very few specimens. The meat-hunters had almost exterminated them. At an old meat-hunter's camping-place, in a grove of palms, *thirty heads* were found. It is no longer worth while to go sheep hunting from San Quentin.

In the vicinity of Magdalena Bay, sheep are hunted successfully by the residents; and various other localities on the Peninsula have furnished specimens.

In Arizona, mountain sheep are to-day found in the Colorado Cañon, on San Francisco Mountain, in the Santa Catalina range, on the Gila Mountains, the Tinajas

Altas and on the Quitovaquita range, near the Sonoyta Oasis. A very few years ago some cowboys roped and caught a ram that came down to Quitovaquita village to drink at the beautiful spring that rises in the United States about a hundred feet north of the international boundary, and flows southward into the Sonoyta. That was the last sheep ever seen in that vicinity. We found no sheep horns in any of the settlements on the Sonoyta.

Regarding the identity of the sheep of southern California and the lower Peninsula, I have no positive first-hand information. Those of California have been (rather hastily?) credited to *Ovis nelsoni;* and those collected by Mr. E. Heller, of the Field Museum, in the San Pedro Martir Mountains of Lower California, were described by Mr. D. G. Elliot as *Ovis cervina cremnobates;* which, being interpreted, means a sub-species of the longest-known Big-Horn. I think that both *nelsoni* and *cremnobates* are open to doubt, and I venture to predict that whenever an extensive series of specimens has been brought together the claims of both those groups to separate recognition will disappear. It is to be remembered that *Ovis nelsoni* was founded on specimens collected in July —the month of all months wherein the pelage of a North American ruminant gives but very slight indications of the real colours it will assume when perfectly developed, later on.

On the mainland of Mexico, the first mountain sheep found and reported to zoologists were in the mountains around Lake Santa Maria, in northern Chihuahua, about seventy-five miles south-west of El Paso. On the eight

specimens collected there by E. W. Nelson in 1899, Dr. C. Hart Merriam founded the new species *Ovis mexicanus;* and it has come to stay. It is distinguished by its very large ears and large molar teeth, and a forehead that is noticably less concave than that of the Big-Horn (*O. canadensis*). Unfortunately, the home of the Mexican Mountain Sheep was so easily reached by hunters from the United States, and the number of sheep within it was so small, *that the species has already been almost exterminated in its type locality!* Four years ago two experienced American sportsmen went thither, and hunted diligently, but found no sheep.

In 1898, Mr. Willard D. Johnson, of the U. S. Geological Survey, observed three living mountain sheep in the Seri Mountains, half-way down the eastern shore of the Gulf of California, opposite Tiburon Island. Shortly afterward Mr. Johnson furnished me a record of his find, and in it he made the following statement:

"As observed at a distance of one hundred and fifty yards, the adult male bore no visible marks of difference from *Ovis montana* [now *canadensis*] as seen by me in Nevada."

Judging from all present information, the state of facts regarding the mountain sheep of Mexico appears to stand as follows:

1. East of the Sierra Madre (the "Mother Range" of the Rockies), there exists a completely isolated group of sheep which have developed into a form that is truly and visibly distinct, and justly called *Ovis mexicanus.*

2. Unless the remnant individuals of this species (*if*

there are any!) are quickly and rigidly protected by the Mexican government, the species will be as dead as the dodo in ten brief years.

3. The old-fashioned Rocky Mountain Big-Horn comes down the Colorado River and its tributaries from Colorado and Utah, through Arizona to Sonoyta and Pinacate. With the exception of a few particularly hardy stragglers that have pushed a little farther south along the coast, the species stops at Pinacate on the north-eastern shore of the Gulf of California.

4. The sheep of Pinacate could easily be exterminated in three years or less, by the Mexicans of the Sonoyta Valley for meat, or by the scores of American sportsmen who are willing to go to the farthest corner of Hades itself for mountain sheep.

5. It is very unlikely that the mountain sheep of the bias boundary between California and Nevada, of southern California and Lower California, are really a distinct group.

6. All the mountain sheep of Mexico should be protected forthwith. Without quick and effective protection, *all the sheep of Mexico will disappear, forever*, and it will take place so quickly that the world will be surprised by the news that it has taken place. In that dry land, the big game holds on by a very narrow margin of safety. Its herds are small and easily found, and the average resident cares not one rap for posterity, the future, or aught else save the meat supply of the present hour.

Since the foregoing was written, an incident of importance to the mountain sheep of Mexico has taken form.

On June 28, 1908, the *Los Angeles Times* published a carefully prepared account, with full details and illustrations, of a hunting trip for mountain sheep made in May, 1908, by two men and one woman of the south-western United States, to the hinterland of Magdalena Bay, Lower California. That was in the lambing-time of the animals that the party went to hunt—a period in which most sportsmen believe that big game should be immune from attack.

According to the newspaper, the two sportsmen and one sportswoman killed *seventeen* sheep, some of which were ewes, with nursing lambs! The illustration showing the hunters and the trophies distinctly reveals the skulls of three female sheep. It was stated in the text that one of the principal members of the party proposed to place some of the sheep remains in a museum.

The slaughter of seventeen sheep as the "bag" of three hunters, and the published statement in the story of it that *Mexico is wholly without game laws*, compelled me to lay the available facts in the case before the Mexican government, and suggest the desirability of the immediate enactment of game laws providing for the proper protection of the mountain sheep and antelope of Mexico. It was suggested that the annual bag limit for mountain sheep be fixed at two rams, and that the protection of antelope be made absolute.

On the day that the proof-sheets of this chapter came, I received from the Hon. Señor Olegario Molina, Secretary of the Department of Fomento, under date of August 15th, a letter containing the following information:

"Please accept my thanks for the trouble you have taken in this matter, in order to acquaint me with facts bearing upon the wanton extermination of valuable animal species.

"The President of the Republic was at once placed in possession of the data which you sent me, and he has instructed the Department of the Interior to collaborate with this Department, and draw up the necessary measures to put an end to the evil, with as little delay as possible."

It is profoundly gratifying to know that in a very short time—presumably only a few weeks—the mountain sheep of Mexico will be under strict protective laws. When the Republic of Mexico undertakes to protect its big game no American will be so unwise as to molest it unlawfully; for Mexico has the habit of dealing out swift and adequate punishment to law-breakers.

The foregoing information is herein set forth for two purposes; to inform all sportsmen that henceforth hunting in Mexico must be conducted in accordance with the provisions of protective game law, and also to advise the Reader that the mountain sheep of Mexico are to be no longer at the mercy of hunters who kill as many as they possibly can.

CHAPTER XXV

THE FLIGHT FROM PINACATE

Mountains Being Buried by Sand—The Meeting of Desert and Lava—Antelopes for Mr. Phillips—The Represa Tank—The Mexican Wagon Wins Out—Heading for Gila Bend—The Ajo Valley—Gila Bend—A Dinner Fit for the Gods—Back to Civilization.

It is not my purpose to exhaust the staying-power of the Reader by a prolonged account of our return journey; for a very few words about it will be sufficient.

When we broke camp at the Tule Tanks, on November 22d (temp. 36° F.), we returned to our base camp by way of the granite mountains we had persistently scorned and shunned on our way in. We went in order to see how their condition might be affected by their peculiar surroundings; and they well repaid the extra travel that the V-shaped diversion involved.

Those isolated mountains of clean gray granite stand where the eastwardly rolling waves of the littoral sands break against the high and ragged edge of the lava plateau. Although those mountains must be about seven hundred feet high at their highest point, they are now actually being *buried* by the desert sands that are remorselessly creeping up and over them from the west. Out in the sand-hills, about four miles (I think) beyond the borderland group, there stand two forlorn-looking granite peak-

lets that remind one of stranded hulks. Already they are half buried under the sand that has blown over them. Their look of hopeless abandonment is really pathetic, like the sight of a man drowning beyond the reach of succour. In a few more years they will be *entirely buried*, and in their place will appear two lofty sand-dunes, each three hundred feet high or more. Probably the young geologists of a hundred years hence will try hard to account for those wonderful manifestations of the sands, little dreaming of the granite peaks that lie sepulchred within. We tried to secure good photographic records of them, but they were so far away, and there was so much fine sand in the air, their details were not satisfactory.

Our own Saw-Tooth Range has escaped being overwhelmed by the thirty-foot-thick plain of brown lava from the east only to be smothered later on by the inexorable sands. The accompanying illustration shows not only the progress of the sand up the western slopes of the mountains, but also the character of the edge of the sand-hills. The barrier of creosote bushes that has been thrown out a mile beyond the edge of the lava bravely is struggling to hold back the encroaching sands, but the effort will be in vain. In time—as compared with eternity—the sand will lie level with the top of the lava plain, and then it may even blithely drift on the Pinacate Range itself. Of a verity this old earth is still in the making.

About half a mile north of the Saw-Tooth Range, in the big arroyo that comes down from the Papago Tanks, there was, on November 23rd, a fine pool of water, now duly marked on Mr. Sykes's map. The mountains make

From a photograph by J. M. Phillips

The Side of the Awful Choya Peak

From a photograph by J. M. Phillips

The Sand Burial of the Saw-tooth Mountains

for it an excellent water-sign, either from the gulf coast or elsewhere; and from the west, the way to it lies directly through the most southerly notch. Anyone shipwrecked in Adair Bay might win out to civilization by coming to it across the sands, then following our trail to the Papago Tanks, and so on eastward to the watery portion of the Sonoyta.

The need for an adult pair of antelopes was so pronounced that when we left the Papago Tanks and started homeward, Mr. Milton, Mr. Phillips and Charlie Foster took their horses and a modest pack outfit, and struck out straight across the lava for Agua Dulce, to hunt antelope on the way. At the Cerro Colorado (Crater No. 1), practically on the very spot where a band was seen and shot at on November 12th, Mr. Phillips had the good luck to find and kill a fine pair of full-grown prong-horned antelopes, both of which were carefully preserved "for museum purposes." His struggles with Charlie Foster—to keep him from spoiling the game—were both interesting and exasperating, and demonstrated once more that, for unadulterated cussedness in the presence of game, the Mexican guide is entitled to the championship of the world.

With the wagons and other impedimenta, the rest of us pulled back to the Sonoyta valley the way we came. The trip was full of interest but without accident, save the breaking of the reach of the Mexican wagon. On the morning of November 25th, we watered our horses at the Represa Tank, a half mile south of the Camino del Diablo, on the edge of the Tule Desert. It is close beside

the last granite mountains south of the trail as you enter that desert from the east. A very curious layout of stone has been carefully built as a face for the western side of the dam across the notch wherein the tank lies. It looks like a series of foundations for a row of eight-by-ten houses backed up against a two-hundred-foot stone wall that extends the whole length of the dam. The stone rectangles are evenly spaced apart, and the walls are all of a uniform height. I have asked a dozen men to tell me the answer to this curious conundrum in stone; but thus far no one has been able to do so, and I am still guessing.

We tarried in the Sonoyta settlement only just long enough to adjust our business affairs and repack our wagons. Glory be, we brought in "the Mexican wagon" intact, and under its own steam! It was true that its left hind wheel had collapsed on the axle, the tongue had been broken by those wild mules, a single-tree had worn in two, half a foot had been broken out of the middle of the reach and the brake had ceased to work. But Mr. Sykes had fixed all those little trifles, and the wagon as a whole was intact. Mr. Escalente accepted it without imposing demurrage, and we were happy in having achieved the impossible.

El Teniente Medina was on hand to see us safely across the boundary, and after parting from him and our good friends Jeff Milton and George Saunders, with many expressions of mutual regard and regret, we mounted our wagons once more and fled northward as fast as we could go.

Owing to the shortness of my time, Dr. MacDougal

decided that we should strike north to Gila Bend, on the railroad, and thereby save at least two days' time.

With two dry camps and one wet one, we made the run of ninety miles in a little more than three days. We went up the Ajo Valley, past the Ajo copper mines, and received at "the store" of that settlement not one of the dozen letters that we eagerly expected. There is no regular mail service to the mines, and the inhabitants depend for their mail upon the kindness of the freighters who come southward with huge four-horse mountains of supplies, especially baled hay.

Thinking to intercept our mail in transit, we accosted the first freighter whom we met above the mines, with a touching appeal. At the first mention of the magic word "mail," which in every country has a clear right-of-way to every honest man's heart, the young American driving the outfit pulled up sharply, threw down his whip, seized a loaded gunny-sack that lay on the seat beside him and leaped to the ground. A moment later a bushel of mail lay before us in a heap on the clean sand, and we eagerly went through it, piece by piece. Again there was absolutely nothing for our party, and after thanking the obliging and sympathetic mail-carrier—who seemed really sorry that we had nothing coming to us—we drove on our respective ways, like ships that pass in the night.

The Ajo Valley is not half so interesting as the trail from Tucson to Wall's Well. It consists almost wholly of creosote bushes and mesquite, with a trace of palo verde, in the proportion of 95, 4 and 1, respectively. Above the Ajo mines the large cacti of all species are conspicuously

absent. The mines are quite the northern limit of the organ-pipe cactus. There are no yuccas, nor palms of any kind, and no tree choyas nor saguaros worth mentioning. Beware of taking that valley as a sample of the desert vegetation of southern Arizona, for botanically the northern end of it is distinctly below the mark.

The Gambel quail and jack-rabbit stayed with us in fair numbers, and at long range we saw an occasional coyote. When twenty miles from the railway and the Gila River, we saw the smoke of a labouring locomotive, and by that token we knew that our holiday was nearly over. On the morning of December 1st, which I most unwittingly remarked as being my birthday, Dr. MacDougal and Mr. Sykes left early with Frank Coles and the light wagon, to reach Gila Bend ahead of us. There were many things to do in connection with getting away on the next east-bound train, to Tucson—so they said.

Our freight train rolled into Gila Bend about noon; and it was Sunday. The town has about forty houses on a level plain two miles from the river, and is garnished with loafing Co'capaw Indians that are spelled Cocopah. It was a deputation from that tribe that left Sampson and Litchfield in the lurch, a hundred and fifty miles from the railway.

With the utmost haste we procured and packed a big box for the Carnegie Museum at Pittsburgh, a bigger one for New York, and delivered both at the station. Then the Doctor invited the whole party to a "birthday dinner" that had been specially prepared for the Pirates of Pinacate by "Missis Rucker" McIntyre—because the hotel of

the town had been found quite unequal to the occasion, and confessed its inability to make good.

At 4 P. M., all hot, thirsty and hungry as six grizzly bears, we sat down to a sumptuous board that was loaded down to the guard-rails with good things. We had roast chicken, rich cream gravy, *mashed potatoes*, fried eggs, hot biscuits, exquisite fresh butter, pickles, peas, *apple pie*, milk and coffee. And, gentlemen, how those five men did eat! It was a sight for gods and men! And the dinner was fit for the gods; quite so; but we were mighty glad that "the gods they didn't get it!"

The station agent was an ex-member of the U. S. Geological Survey, and a mighty good fellow. Incidentally he was starving for a chance to hear something about Hillers and Gannett and Stevenson and Hague, and all the others whom he had known "in the field" so long ago; and I gladly told him not only all that I knew about his old comrades-in-arms, but much more.

As we boarded the train for Tucson we were a tough-looking crowd, and it was no wonder that the passengers stared at us, doubtfully and fearfully. Jess Jenkins came on board for a last good-bye and blessing; and he was so ragged and sun-burned that he looked like a land pirate for fair. But his good humour and droll persiflage lasted to the last moment. Leaving him and Coles—yes, and Bob Dog, thank Heaven!—to drive the wagons leisurely to Tucson, the four of us hied eastward through the darkness toward store clothes, money, home and letters from home.

The reaction from the steady and severe rush of the

trip left us limp and spiritless, and it was four full days ere one member of the party began to feel quite like himself again.

But all's well that ends well; and may the Reader some day make that journey himself.

ADIOS

A SPORTSMEN'S PLATFORM

FIFTEEN CARDINAL PRINCIPLES AFFECTING WILD GAME AND ITS PURSUIT

PROPOSED BY WILLIAM T. HORNADAY,

APRIL 17TH, 1908.

1. The wild animal life of to-day is not ours, to do with as we please. The original stock is given to us *in trust*, for the benefit both of the present and the future. We must render an accounting of this trust to those who come after us.

2. Judging from the rate at which the wild creatures of North America are now being destroyed, fifty years hence there will be no large game left in the United States or in Canada outside of rigidly protected game preserves. It is therefore the duty of every good citizen to promote the protection of forests and wild life, and the creation of game preserves, while a supply of game remains. Every man who finds pleasure in hunting or fishing should be willing to spend both time and money in active work for the protection of forests, fish and game.

3. The sale of game is incompatible with the perpetual preservation of a proper stock of game; therefore it should be prohibited, by laws and by public sentiment.

4. In the settled and civilized regions of North America, there is no real *necessity* for the consumption of wild game as human food; nor is there any good excuse for the sale of game for food purposes. The maintenance of hired labourers such as miners, lumbermen and railroad-builders, on wild game should be prohibited, everywhere, under severe penalties.

5. An Indian has no more right to kill wild game, or to subsist upon it all year round, than any white man in the same locality. The

Indian has no inherent or God-given ownership of the game of North America, any more than of its mineral resources; and he should be governed by the same game laws as white men.

6. No man can be a good citizen and also be a slaughterer of game or fishes beyond the narrow limits compatible with high-class sportsmanship.

7. A game-butcher or a market-hunter is an undesirable citizen, and should be treated as such.

8. The highest purpose which the killing of wild game and game fishes can hereafter be made to serve is in furnishing objects to overworked men for tramping and camping-trips in the wilds; and in most countries the value of wild game as human food should no longer be regarded as an important factor in its pursuit.

9. If rightly conserved, wild game constitutes a valuable asset to any country which possesses it; and it is good statesmanship to protect it.

10. An ideal hunting-trip consists of a good comrade, fine country and a *very few* trophies per hunter.

11. In an ideal hunting-trip, the death of the game is only an incident; and by no means is it really necessary to a successful outing.

12. The best hunter is the man who finds the most game, kills the least and leaves behind him no wounded animals.

13. The killing of an animal means the end of its most interesting period. When the country is fine, pursuit is more interesting than possession.

14. The killing of a female hoofed animal, save for special preservation, is to be regarded as incompatible with the highest sportsmanship; and it should everywhere be prohibited by stringent laws.

15. A particularly fine photograph of a large wild animal in its haunts is entitled to more credit than the dead trophy of a similar animal. An animal that has been photographed never should be killed, unless previously wounded in the chase.

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